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Growth of Electrical Power Used. As an indication of the greater realization of the advantages in the use of electric power, the increase in consumption of energy for power work on the circuits of the Edison Illuminating Company is interesting. With no particular improvement to cause special attention and add to the number of users of electric power in the city during 1895, the first 10 months of that year saw an increase in power installations of nearly 50%, or over 3,600 horse-power.

The British South Africa Company and Pastoral Industries. The idea is prevalent even in England that the British South Africa Company exists chiefly for the benefit of the prospectors for minerals which are supposed to exist in Matabeleland, Mashonaland and other districts under its administration. This, however, is a mistake, for the company is doing everything in its power to encourage agriculturists to settle in the healthy sections of the territory. Its official gazette in the issue of December 11th contains a notice intimating that cattle will be sold to bona fide settlers at fifty shillings a head, the amount being payable in four installments, but security for the discharge of the debt is required. This, although apparently a comparatively unimportant announcement shows that the British South Africa Company does not exist alone for glory, land-grabbing or gold fever.

American vs. English Cannel Coal. It would be difficult for many of our readers to realize that in spite of the excellent quality of Cannel coal mined in this country the fire department of New York is for the first time in its history burning American Cannel coal. Heretofore no matter what the inducement might have been, English Cannel coal has invariably been used; the price ranging from \$13 to \$16 per ton, or about four times more than a first-class hard coal. Of course, Cannel coal whether English or American is a more rapid steam generator and that is the great point to be attained in case of fire so as to bring into play the full power of the engine. The coal that has now displaced the English Cannel coal comes from West Virginia, and in the test was found to be equal to it, with the result that as it could be delivered at from \$3 to \$6 less than the English coal the tender was accepted with a considerable saving to the Department.

Roentgen's Discovery. In our last issue we referred editorially to the development of Professor Roentgen's new work and the possibilities that might result from it. In that presentation of the case, as it appeared from the evidence before us, partly derived from the English and Continental press, special private information and from the full cablegrams supplied to our daily contemporaries, we ventured the opinion that the new rays are "invisible chemical rays," and, although we are not certain, we believe that Professor Roentgen himself is somewhat of the same mind. At all events, he has evinced his more than doubt as to their being what are commonly called, "cathode rays" (whatever that may exactly mean!), and has shown this by his expression of his present nomenclature or definition of them as x rays, i. e., unknown quantity. We are astonished that this point has not been seized upon and more closely investigated by scientists in this country, but we do notice that Professor Michael I. Pupin, of Columbia College, in an interview with a representative of the Journal made the following remarks:

"One of the most peculiar features about the 'x ray' is that it is so subtle that even glass becomes opaque in its presence. This was demonstrated to-day by a photograph which I took of a pair of eye-glasses enclosed in a leather case. In the picture there was scarcely a trace left of the leather; the rim and other metallic portions of the spectacles showed quite plainly, but most distinct of all was the glass. This indicates that the 'x ray' acts upon objects in a chemical manner, eating its way through them, as it were, like acid."

Protection to Miners. We are glad to welcome a new means in Colorado of more efficient State protection for miners. The system in operation in Pennsylvania and other large coal producing states has been developed to such a point as to be more than fairly efficient, and in Michigan the regulations governing Iron Mining are carefully adhered to and are found effective in reducing loss of life among those working in the mines. Now, for the first time so far as we are aware there are earnest and practical attempts to provide proper and legitimate safeguards for the miner in precious metal mining. The information is conveyed to us in Bulletin No. 1 of the Colorado State Mining Bureau entitled "Recommendations for Safely Appliances in Mining." The sense and spirit of these recommendations are practical and feasible of execution; not like some red tape regulations that are impossible in themselves. There is no difficulty whatever of all these recommendations being carried out in every mine of importance in the State and in fact, such is the constant practice in all those that are properly managed. We are sorry to say, however, that sometimes from insufficiency of capital, false economy, and greed to obtain results without

weighing expenditure in proper works against men's lives, and again in some cases from sheer ignorance, risks are incurred that should not exist. Mr. H. E. Lee, Commissioner of Mines, in concluding this first bulletin, makes an appropriate remark: "The common rule and the source of most accidents is the desire to first 'strike it rich and then make safe,' while he looks upon his duty to 'first make safe and then strike it rich.'"

#### The Transvaal Troubles.

On January 31st, Mr. J. Story Curtis in a dispatch from Pretoria cabled to the *Journal* via Colesburg (thereby showing that the dispatch had to be sent out from the Transvaal before it could be transmitted), very fully states the condition of affairs in the Transvaal up to 1884 and since, the latter period being a complete change from the former. Mr. Curtis states that the new population is now more than double the number of the original vote-holding population of the Republic. The new comer is indirectly taxed heavily, has no voice in the affairs, no control whatever over the taxation or in legislation. The various towns which have sprung up have no representation, and more than 10,000 English-speaking people have to send their children to Dutch schools if they wish to gain any aid or assistance from the government educational system. Since 1888 the legislation has been mostly reactionary. The five years residence for citizenship has been extended to 15 for men who naturalize themselves after they are 30 years with the result that no one can become a citizen before he is 44 years old, and children born of parents not naturalized cannot become citizens. A naturalized citizen has no vote in the assembly which controls the finance of the republic, regulates the taxation, and determines the general policy. Without some effectual and immediate remedy the loss to American residents will amount to millions.

By cable this morning, under date of February 6th, we learn that Mr. Hammond has been liberated on bail. We regret to state that a dispatch of later date gives the reason on account of illness aggravated by his imprisonment that the conditions of his temporary release are severe.

The last dispatch to the *Journal* from Mr. Curtis was sent by special messenger via Newcastle, Natal, dated February 5th, showing that the Government censor had laid an interdiction upon telegraphic communication between those arrested and their friends outside, and all communications made to them recently by cable through ordinary channels have remained undelivered.

From the information given by Mr. Curtis in this dispatch it appears that Johannesburg is practically under martial law. He states that no information by wire has been received from New York for five days, and this to our knowledge without any interruption to either of the two cables connecting with the Transvaal; even our Consular representative for seven days has been unable to get a reply to his dispatch sent from Pretoria.

Taking such a deep interest most naturally, in the many Americans now located in the Transvaal, and not a few of whom are in trouble we have done our best to ascertain the exact status of those arrested and released on bail, and those who are not released. We have therefore called upon Mr. Charles W. Truslow, counsel for Mr. Hammond and other prominent Americans at present accused by the Government of the Boer Republic of conspiring against its rights and integrity. It is just barely possible that this and former information which we have published in the *Engineering and Mining Journal* may be the first intimation to those most interested as to what is really needful for their own guidance. Mr. Truslow says:

"The latest information I have from the Transvaal was contained in a despatch received Monday from Cape Town, which indicated that the situation was becoming more serious, and requested me to personally appeal to the Government to take more active and vigorous measures for the protection of the citizens of the United States in trouble at Johannesburg.

"The fact that this message came from Cape Town, though sent at the request of friends of Mr. Hammond, who would certainly have communicated with me directly from Johannesburg had they been able so to do, seems to confirm the statement made in the London *Times* of Monday that there is an actual and severe although not an admitted censorship of all telegrams sent out of the Transvaal. This censorship has been steadily growing more rigorous, and the fact that such censorship is not openly acknowledged by President Kruger has not made it any less effectual in preventing prompt communication between the Americans in the Transvaal and their friends in this country. The importance of such prompt communication will not be underestimated when it is remembered that there is not in this country a single person having any accurate knowledge of either the laws or forms of judicial procedure in force in the Transvaal or the facts upon which the charges against Americans are based.

"It has been stated in certain quarters that the State Department had been slow in acting in this matter; but I can say from my own personal knowledge that both Mr. Olney and the President have, from the first information of the arrest of the Americans, evinced the most active interest in their welfare and taken as prompt means for securing fair play as possible under the circumstances.

"That which is most needed to enable our Government to act effectively is a full and substantiated verified statement of facts, an accurate transcript of the laws which it is charged the Americans have violated and full and complete records of every step heretofore or hereafter taken by either the Boer Government or the prisoners, and justice cannot be dealt out until this information is before the Department. No doubt our State Department will call upon the Transvaal Government for such records; but the Americans whose rights are violated should certainly see to it that a proper brief, with attached records of the whole case, be prepared by able counsel in the Transvaal in their behalf, showing wherein Americans have been wronged under the laws of the Transvaal, and such brief and papers forwarded to this country to be formally presented to the State Department."

#### NEW PUBLICATIONS.

PROBLEMS IN THE USE AND ADJUSTMENT OF ENGINEERING INSTRUMENTS. By Walter Loring Webb. New York: John Wiley & Sons.

The cover title of this book is rather misleading, as "Engineering Instruments" does not describe its contents nearly so well as the sub-title upon the title page, "General Instructions for Extended Student Surveys." The purpose of the work, in the words of the author's preface, is "To supplement, and not to replace, the instructions of text books, by such definite directions that the student may work alone, aided only by such occasional help as may be given by one instructor looking after several parties, and thus solving the vexing problem of properly looking after the work of a large number of students with a limited corps of instruction."

It is not claimed that the book can replace a teacher for each separate part of students, but even in such case it will be found to contain many valuable directions and to be of great use to the student and a great help to the teacher. In the "Table of General Instructions" the importance attached to the keeping of notes and the reporting of each day's work is to be highly commended, while the examples of "note taking" throughout the work will be excellent guides. It is to be regretted that the author has not given an example of just how a daily report of work should be made out. The problems given are well arranged and selected and include most of those usually given in an elementary course in surveying, such as "Linear Measurements," practice with the level, transit, plane table, sextant, barometer, and the use of the planimeter and pantograph in the draughting rooms. The author does not attempt to give instructions for the adjustment of instruments in the absence of an instructor, but does give directions for the testing of adjustments so that a student may know when the instruments are in working condition and not risk injuring them by carelessly attempting to change adjustments.

The chapters on railroad and upon topographical-hydrographical surveys will supplement the part of a teacher, but cannot replace such instructions, and the author evidently does not intend them to do so.

WHEELBARROW: ARTICLES AND DISCUSSIONS ON THE LABOR QUESTION. Including the controversy with Mr. Lyman J. Gage on the Ethics of the Board of Trade, and also the controversy with Mr. Hugh O. Pentecost and others on the Single Tax Question. Chicago. The Open Court Publishing Company, 1895.

This collection of the shrewd and witty articles of the anonymous author known as "Wheelbarrow," might well be placed in the hands of educated men as well as of the class of workmen to whom its contents are ostensibly addressed. In fact it is among the so-called "educated" classes—including particularly the learned professions—and most of all, the clergy—that heresies and visionary delusions in the sphere of finance and law are most common and most mischievous. "Wheelbarrow" is a trenchant advocate of liberty and individualism. From the standpoint of personal experience as a manual day-laborer, he utters a healthy protest against the coddling of his own class or any other, and maintains that the largest possible degree of personal liberty, coupled with personal responsibility to law, is the best atmosphere for both the individual and the community. The plain common-sense way in which he disposes of current sentimentalities and theories is refreshing to the reader of many more pretentious books. I take for instance, almost at random, the following comments on a newspaper article headed, "Drifting Toward Dear Money":

"What is dear money? Something dreadful, certainly; for 'drifting' suggests a ship, helpless and rudderless, moving to its doom. My fright ended when, on reading the article, I discovered that 'dear money' meant something that would buy more goods than money of the cheaper sort; and when, on reading further, I saw that 'dear money' included the calamity of cheap rent and clothes and fuel and bread, I shouted, 'Let her drift!'"

But Wheelbarrow is himself not beyond the danger of sentimental reasoning. He is eloquent, and his eloquence now and then runs away with him. I think this is shown in his attack upon the Board of Trade, for "making bread dear," to which Mr. Gage replied in articles which are reprinted in this volume, and which indicate, on the whole, a juster view of the subject of speculation. Yet, Wheelbarrow says much in this discussion which is true as well as sincere. I suppose that every popular writer on economic questions must denounce somebody, if he is to get a hearing. The general taste appears to demand controversy rather than inquiry; and the partisan flavor of Wheelbarrow's writings gives relish to a good deal of sound doctrine. At all events, he is, in the main, opposed to legislative tinkering with the freedom of labor and of trade; and his honest disgust at the panaceas of demagogues and philanthropists alike is a tonic highly appropriate to the symptoms of our time. The book is, moreover, as interesting as a story. There is not a dull page in it.

#### 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*.

*Commercial Year-Book, Vol. 1, 1896.* Compiled by the *New York Journal of Commerce and Commercial Bulletin*. Pages 430. Price, \$1.

*Ohio State Board of Agriculture: Official Report on Commercial Fertilizers for the year 1894.* Columbus, O.; State Printers. Pages, 30.

*Transactions of the American Society of Mechanical Engineers; Vol. XVI, 1895.* New York; Published by the Society. Pages, 1,203; illustrated.

**New Safety Blasting Cartridge.**—A new safety cartridge for mines where the flame of the explosive is dangerous is reported in use at the collieries at Polish Ostrau, in Austria. A quicklime and a dynamite cartridge are connected, so that the slacked lime heats a primer sufficiently to fire off the detonator embedded in the dynamite. The compound cartridge is enclosed in a bag of loose cotton, woven like a wick. The experiments were made in a gallery containing 7% of methane and a great deal of coal dust that was kept in motion, and in no case did the cartridge fire the gases or the dust. The flame is confined to the interior of the cartridge, and is stopped both by the slacked lime and the water in the bore hole at its upper end.

## 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.

## Molybdenum.

SIR: Will you please let me know the value of molybdenum, where it can be treated, and if there is any market for it? and oblige,  
1863 Arapahoe Street, Denver, Colo. T. S. ROWAN.

We recommend you to apply to the American Metallurgical Works, F. Cremer, Manager, Phoenixville, Pa. The price of commercial molybdenum is \$1.31 per pound.—[Ed. *Engineering and Mining Journal*.]

## The Iron Mountain Mine.

SIR: In your valuable Journal of December 14th (p. 562) Mr. H. M. Beadle, under title "The Iron Mountain Mine," writes of a serpentine mass in which silver-lead ore bodies are worked.

This is exceedingly interesting to me from a genetic standpoint, and I am very desirous of obtaining specimens both of rock and ore: (1) from the "Forbes" contact vein, and (2) from the "Wallace" and "McDonaid" bodies.

Speaking of these latter Mr. Beadle says: "There is not a great deal of difference between the ore and the wall rock; there is no gouge or seam or any mark to determine the boundary between the pay and the country rock, and in mining the rock is broken as far as the pay goes."

I would especially like to have specimens of this rock ore, rich, middling and poor, taken from the deepest workings where it is, presumably, freshest (undecomposed). They need not be big specimens (say about size of one's fist) enough to show general structure and to furnish ample material for thin sections for the microscope.

Now would you be so very obliging as to obtain these for me and forward them here, in the understanding that I would refund any expense incidental on carriage, etc., through Mr. Walker, your manager in London. You might send the samples to him if more convenient.

FREIBERG, BADEN, Gartenstrasse 1, Jan. 4, 1895.

F. GILLMAN.

## The Butte &amp; Boston Mining Company.

SIR: The recent drop in price of the Butte & Boston stock has given rise to wild rumors at the Boston exchange. No official statement being made, it might be of interest to your readers to have some facts. The exact amount of bonds is \$1,000,000, due December, 1898; \$2,000,000 consolidated bonds, of which \$600,000 were sold and are in circulation, while \$400,000 are in the treasury, and \$1,000,000 kept to be exchanged against those due in 1898.

Practically there are only \$1,600,000 issued; there is further a floating debt of \$358,000, to which may be added \$140,000 loaned, but not used up yet, for the purpose of developing the properties and opening up sufficient ore reserves during the next six months to allow the smelters to operate without stopping in future for temporary lack of ore.

Hence the financial condition of the Butte & Boston is by no means as bad as described. The copper properties of the company are excellent, rivalling in value with any other Butte property. The causes for the present muddle are the mismanagement of Superintendent Palmer and Director Coram (both of Merced fame). The first one resigned some months ago, and the earlier the company gets rid of the second one, the better for the stockholders. Not only were no developments made and ore-bodies opened up in advance, but properties were bought and leases given without even consulting the Boston directors. Happily a most important lease runs out next September. I understand that the parties working on this lease took out immense quantities of the very best copper ore, and that this part of the property shows up splendidly. The reasons for leasing such ground can only be surmised.

Your journal always clamored for official statements, and so did the Boston Herald (the only one among all Boston newspapers to do so); however, the stockholders were indifferent and the speculators on margins have to blame themselves, if they deal in unknown quantities. In fine, the properties owned by the company are excellent, and the former mismanagement has given place to a competent management composed of such trustworthy officers as Captain Couch for the mining part, and Klepetko, of the Great Falls Works, for the smelting. M.

BOSTON, Feb. 5th, 1895.

## South African and American Gold Mines.

SIR: I crave a portion of your valuable space to reply to the letter entitled "South African and American Gold Mines," which I noticed over the signature of Mr. W. Weston, of Denver, Colo., in your issue of August 24th. Having until lately for some time held the post of manager of a gold mine in South Africa, and being now employed in a similar capacity in Western Australia, I may perhaps be permitted to comment on a few of your correspondent's strictures on those countries, with which and the conditions existent in them he appears to be totally unacquainted. In the first place, I should like to know which is the property for which people were "so senseless as to pay at the rate of fifty-six millions" (he does not say whether pounds sterling or dollars), and "which has never paid a dividend?" Does he refer to the British Chartered South Africa Company operating in Mashonaland and Matabeleland, or to the whole of South Africa generally?

Secondly, I might state that the Transvaal is not an English "possession" (by which I presume your correspondent means "colony"), but an independent State, having been retroceded to the South African Republic in 1882. Being well acquainted with all the leading mines on the Rand which I left as late as last March, I can only regret that Mr. Weston's "friend of good standing, who would not purposely make the slightest misstatement," could have been so egregiously misinformed as to the actual doings and merits of a group of mines at present producing about 200,000 oz. of gold monthly from a field not much over 40 miles in length. It is not, I think, out of place to mention here that many, if not indeed most, of the leading mining engineers on the Rand are Americans. I need only allude in this connection to

men of such unexceptionable standing as Mr. Hamilton Smith, engineer to Messrs. N. M. Rothschilds & Sons; Mr. John Hays Hammond, engineer to the Consolidated Gold Fields of South Africa, Limited, and to the British Chartered South Africa Company; Mr. Hennen Jennings, engineer to Messrs. Wernher, Beit & Company; Mr. Geo. W. Starr, engineer to Messrs. Barnato Bros.; Mr. Geo. E. Webber, manager of the Crown Reef Mine; Captain Mein, manager of the Robinson Mine; Mr. Chas. Butters, managing director of the Rand Central Ore Reduction Company, Limited, to say nothing of many others. Also, that a large proportion of the English capital of which your correspondent complains as having been "wasted" in South Africa (*i. e.*, not laid out at Cripple Creek, where no doubt "every prospect"—but more especially his own—"pleases") has been laid out on the recommendation and under the guidance of these gentlemen. Surely, when they see his letter they will think that "it is a foul bird which fouls its own nest." Mr. Weston's friend does not, I notice, refer in his letter, or at any rate the extracts from it quoted, to such mines as the Durban Roodepoort and Meyer & Charlton, to mention no others, at Johannesburg, which for some time past have been returning handsome profits to their stockholders. He is not, I take it, aware of the existence of the Transvaal Gold Exploration and Land Company, Limited, on the Lydenburg fields, or the Sheba Gold Mining Company, Limited, on the De Kaap, which have for years past made large profits.

And now to turn to Western Australia. On the Pilbarra gold-fields, in the Northwest, where I am at present working, we have both fuel and water. We calculate that \$20 per ton and upward will pay, but this is only because the rates for labor (\$20 per week) and transport (\$75 per ton) from the sea coast (120 miles) are ruling very high. The government have already sanctioned the project for a railroad, which we expect will be carried out shortly, when we shall, of course, be able to work much more cheaply. As regards the Londonderry mine, to which Mr. Weston alludes in his letter, that is only one swindle out of many good mines at Coolgardie. "Let him that is without sin among you cast the first stone," we are told. I daresay that your correspondent has not heard that four of the principal vendors of the above-mentioned mine, viz., the Earl of Fingall, Colonel North, Mr. Plunkett and Mr. Myring, as soon as they were cognizant of the actual state of affairs, at once refunded to the stockholders their share of the purchase money, amounting to several hundred thousand pounds.

You, sir, must be aware that you have among Englishmen a great many admirers of what we all admit to be the leading mining paper in the world, and the tone which your correspondent has seen fit to adopt, implying that we are all either fools or knaves, cannot fail to give serious offense to this section of your readers. It is an old saying with us that "you can drive a horse to the water, but you cannot make him drink." I ask you, then, does Mr. Weston think that his letter is likely to induce the harmless but necessary English investing horse (or as he no doubt would prefer to have it—"ass") to drink exclusively at the waters of Cripple Creek?

FRANK OWEN, A. M. I. C. E.,

Manager of the Northwest Australian Gold Fields, Limited.

MARBLE BAR, Western Australia, Dec. 3, 1895.

## The Acetylene Mystery.

SIR: I have read the articles in your paper on acetylene with considerable interest and profit. Yours truly,

W. D. BRANDT,

XENIA, Ohio, February 3, 1896.

Manager, Midland Paper Co.

SIR: The action of the Willson Calcium Carbide schemers in keeping so quiet in technical particulars is probably misleading to some extent. They hope for the inference that they are like a certain noble Roman's wife, above suspicion. This might be their answer to fool us except we chance to know them all by repute. It really does look as if they hadn't anything to say, because they are in an indefensible position. They should be encouraged, however, by the fact that we have told them generously that we are only trying them now on circumstantial evidence. A few of their stubborn facts will knock our circumstances entirely out. It isn't worth while? Oh, yes it is. The stock craze is over among high class people and a few facts in favor of the scheme might start it all up again. That's not what they want. If not, why did they encourage and foster it, get rich and go traveling? They are after commercial results? Yes, they are—at Spray, near Leaksville! They don't seem to like the commercial facts as they are produced in the East. The Eastern cost of \$82.50 is a long way above the Southern \$5 to \$7. I presume the climate is so salubrious at Spray, that that old water wheel gets round five times there in the same time it would revolve once here. We would all see it here; there we do not—very much like the shell game—"Now, gents, up with your money; now you see it and now you don't." The whole performance is about as foolish and unsafe.

Ah, but Prof. Suckert says: "Look at the light, gentlemen! The quintessence of electricity, sunlight for a verity!" True, professor, but why don't you show the cost of the carbide basis of your sunlight?

They say carbide is valuable, has a wide market, and they can make a ton per day and cheaply—a revolution in lighting! Profits of 300% to stockholders! Get some stock quick! This is the line they are running on. But when we want calcium carbide, we cannot get it except at prices which would make the gas cost about \$100 per 1,000 ft. This is not exaggeration, it is a fact.

This is the way they are now doing business: The writer has been told of a case where their chemical house representative and two or three of their chief officers were written to for calcium carbide. What was the answer? One of the party replies for the batch, recounting the glories of the case, actually quoting the Franklin Institute fairy tales, and suggesting the great profit to be made by the purchase of the "rights" for the inquirer's city!

Looking at this phase of the case, let us see what they are after. They say now they are selling "rights" to what they may have and not on a promise of \$5 to \$7 or any other definite cost. Their policy is that with a thousand patents and large means they will own the field. They may get two thousand patents and they all may be "valid" and still worthless to give them a monopoly. So far as their "large capital" is concerned, it does not amount to much. It has been shown that their

chief people are not nearly what many people supposed them to be in importance. They really haven't any kind of a natural business connection with any great interest in America. This throws their enterprise back upon the individual leaders. These gentlemen have considerable money, and it will be noticed that it is not going into this scheme, but is industriously being added to by the cash of the "outsider," which is coming in from the sale of "rights." They tell us that their scheme is a "bonanza." Did any one ever know the leaders of this party to let a good thing get by them if they could keep it? For a year and a half this party has been raising an uproar about their "bonanza," and out of the whole has come the sale of a lot of stock and "rights": when with the means we all know them to have, if they could have produced their calcium carbide at the prices they have claimed, and it was the "bonanza" they claimed, they could have made, by legitimate manufacturing, no doubt more money than they have made by the questionable course which has been pursued. That they did not follow the regular order of business is strong circumstantial evidence that they have not believed in their own promises and prognostications. If they had not had the money themselves to carry on the work, they would have had a legitimate reason to ask for the money of others. But we know they have considerable means, and they have told us they have the support of the leading gas interests (which is an error), and consequently they have proved their own rank insincerity by "soaking" the "outsider."

They must make calcic carbide for \$5 to \$7 per ton to make their promises good. I do not believe they can do the business commercially under \$70. At the latter figure, the market for it will be exceedingly limited. That is about what it is costing in Europe at the several plants where it is being produced. After the first scientific demand was supplied, the bottom dropped out, so to speak, and now I am informed the market amounts to practically nothing. The greatest field for calcium carbide will be as a gas enricher, but, as I have said before, it cannot compete with present enrichers unless it can be produced and converted into acetylene at less than \$20 per ton, which can only be accomplished by getting a fuller efficiency of the heat of the electric arc or getting power cheaper than has ever been conjectured. Then when such a power is found, it will probably pay better to use it in other directions. This present party of calcic carbide people will find their only market to be that of isolated lighting. This is a very limited field.

The disappearance of the war scare has upset one plan for making large profits, and which plan, I am forced to admit, has seemed to me to be more feasible for dividends than any of their previous schemes. I have not been "sworn to secrecy," and, as the war is over, I do not see any reason why the thing should not come out, for it does its authors credit for great ingenuity and serves to show what real brainy men may do with an opportunity which the ordinary man would find of no earthly use. The plan in question was, in case of war, to sell to the Government the right to use liquified acetylene in firearms, the results of its use to be considered a "by-product" and to be the property of the "exclusive" owners of the "exclusive" calcium carbide process. In brief detail, liquified acetylene cartridges might have been used in the new continuous-fire gun (about 60 shots per minute). In this manner Mr. Suckert's condensed "sunlight" could have been shot into the eyes of the enemy, who, blinded by its glare (this is sure, as witness its effect on investors), would simply be rendered helpless. Methinks I can see a British regiment all running around like spring chickens with their heads cut off. In this state they become the "by-product" of the calcic carbide process. It is here the calcic carbide party begins to gather in its profits. The "by-product" will now be put up (mark the economy) in the cans which were used to bring the calcic carbide on the field hermetically sealed and shipped directly to cannibal lands as the canned "fruits of victory." I do not wonder at the enthusiasm of the vice-president of the Electro Gas Company, Count Jerzemenowski. This thing opens up vast vistas of glory and profit! Poland may yet be free!

The New York Times of February 4th publishes the following important and interesting technical statement on the subject under discussion: The New York Times sent to Dr. W. H. Birchmore, a recognized authority on the subject, to ask him for a plain, unvarnished statement of the merits and defects of this new illuminant with the following result:

"Dr. Birchmore has been engaged for the last six months in making an exhaustive study of carbide of calcium and its derivative, acetylene gas. He is an expert chemist, and his services were engaged by some capitalists to investigate the commercial practicability of acetylene gas. His conclusions, as summed up by him to the reporter, embrace the five following points.

"1. Acetylene gas is useless for the purpose of reinforcing or enriching ordinary water gas.

"2. Acetylene gas is at least equal, and probably superior, to sunlight for purposes of photography.

"3. No burner now made will consume acetylene gas economically, irrespective of cost, and the invention of a burner with small enough apertures is the first serious obstacle to be overcome before the gas can be tested in comparison with ordinary illuminating gas.

"4. Pure acetylene gas, when burned as an illuminant, makes bright colors brighter and dark colors darker; it might be used in a ballroom, never in a library or ordinary sitting room. It has a flame which is essentially, though not apparently, lavender in color, and thus distorts daylight shades.

"5. If carbide of calcium, from which acetylene is now obtained, can be produced at \$45 a ton, or less, acetylene gas can be used commercially in a limited field." Yours, etc.,

ACETYLENE.

**Electrical Development in Venezuela.**—Ricardo Zuloaga, of Caracas, Venezuela, has been at Niagara Falls with Mr. W. B. Wreaks, of the Westinghouse Electric and Manufacturing Company, to view the power installation there. Mr. Zuloaga is a member of the Compañia Anonima La Electricidad, of Caracas. This company has a project to develop power from two falls in the El Guaire River, the power to be transmitted to Caracas and used there. One of the falls under consideration has a height of about 120 ft. and is expected to give 1,000 H. P., while the other has a fall of 225 ft. and will allow of the development of 2,000 H. P.

#### THE BURNS GOLD MINE, NORTH CAROLINA.

Written for the Engineering and Mining Journal by H. M. Chance.

This mine is one of the best-known properties in the South. It is located on Cabin Creek, in the northwestern part of Moore County, N. C., 15 miles northwest from Carthage, the nearest railway town. It has been worked almost continuously since about 1850. Prior to that time, much gold had been washed from a branch of Cabin Creek, but the milling of ore on a commercial scale was commenced at or about that time.

The ore body consists of a mass of silicious chlorite slate, highly inclined, and ranging from 10 or 15 up to 60 ft. or more in thickness, the ore consisting merely of those bands of slate carrying sufficient gold to justify working.

These slates outcrop in a bold hill, rising some 60 or 80 ft. above the creek, the crest of the hill being parallel with the strike of the deposit, which has been opened and worked by several large open cuts or quarries.

In one of these cuts the material carries gold for a breadth of at least 50 or 60 ft., and although much of this mass was of very low grade, it was all put through the Chilian mills, and the former owners say it more than repaid the cost of milling.

These cuts present working faces 30 or 40 ft. high, impressing one at once with the enormous quantity of material in sight above water level that can be quarried at very low cost.

The mine as worked by the original owners was undoubtedly profitable. The ore was crushed and amalgamated by three Chilian mills, and the tailings then run through a line of plain sluices 800 or 900 ft. long without riffles, and at times the tailings accumulating at the foot of the sluice were rewashed in a rocker. The former owners claimed to have mined and milled the ore a cost of about 65c. per ton; this with labor at perhaps 50c. or 60c. per day, less store profits, and no charge made for management or superintendence. The principal work was done at the south and middle cuts where, the ore was largely free milling, but in some parts of the middle cut and in the north cuts sulphurets were present in considerable quantity, and only such ore was milled that with the ordinary pan test showed a fair quantity of free gold present. Over the greater part of the ground worked in this way the ore was of quite low grade and the recovery of gold still lower, but as the property was cheaply worked, the operation was steadily profitable, although the profit was small owing to the small quantity of ore treated per day.

About 1880 the property was sold and some of the purchase money paid. The new owners continued the operation of the Chilian mills, but failing to complete payment for the property, it reverted to the original owner.

The property was again sold about 1885, and a considerable sum was spent in putting in patent grinding and amalgamating mills. The property again reverted to the former owner and was again worked by him in the old way.

About 1893 the property was taken by the Columbia Mining Company. This company put in Crawford mills. They also built a dam on Cabin Creek and nearly completed a tunnel to carry the water of the creek to the mill for power. The mills were found unsuited to the ore, and this company failing, it was succeeded in 1895 by the Cabin Creek Mining Company. This company built a 10-stamp mill and added bumping tables to save the sulphurets. They are now adding to this plant crushers and Davis "granulators," with Gilpin County bumping tables sufficient to bring the capacity up to a 40-stamp rating, and this crushing and concentrating plant it is proposed to use without amalgamation in connection with a cyanide plant.

The ore giving the best assay returns is the sulphuret ore from the central and northern part of the deposit, and it is this ore I am informed the present company proposes to work. All of this ore is said to carry more or less free gold.

This last attempt to work this deposit will be watched with interest by the owners of many similar deposits.

With the low costs claimed for chlorination, as practiced at the Haile mine, for comparison, it is difficult to see what, if any, advantage will be found in the cyanide process as it is here proposed to use it. The past history of this mine, and the large ore reserves in sight above water level, certainly justify persistent efforts to find a cheap and efficient method of working it.

The success of the Chilian mills indicates that stamping, followed by pan amalgamation and concentration, with chlorination and cyaniding of concentrates, should give the greatest promise of success. The free gold is principally very fine or flaky gold, not very heavy and rather difficult to amalgamate. Fine grinding is necessary to free the gold and sulphurets from the gangue, and this entails the production of much flour gold and slimes, rendering subsequent concentration or amalgamation a slow and difficult process. If the ore treated were sufficiently rich to cyanide without concentration the problem would be more easily solved.

As a result of long experience the former owners found that the best method of saving the fine gold was to run the pulp from the overflow of the Chilian mills through a long line of sluice-boxes made of dressed lumber, without riffles, some of the boxes being set on quite steep grades. Dressed lumber was found to catch the gold better than rough lumber. In a few days these boxes became coated with a thin layer of mixed iron and gold, the iron coming from the Chilian mills, which were fitted with iron bottoms and tires.

**A Mining Deal.**—A certain San Francisco vendor's opinion is that it is the easiest thing in the world to sell a mine in London for almost any price, provided you have anything to show an expert. Some time ago he was in London with a mine to sell. A company was organized, an expert reported favorably, and a meeting was held to discuss the terms. The vendor's price was 50,000. "That," said the spokesman of the syndicate, "is more than we expected to pay. We thought of 40,000. There isn't much difference. Suppose you knock off the odd 10? The vendor ultimately did. When the papers were made out, he was delighted to find that the syndicate had been talking of pounds. He had meant dollars.

TEMPORARY AND PERMANENT REPAIRS TO A COLLIERY SHAFT.

We are indebted to our contemporaries *Annales des Mines* and *The Engineer* for the account by M. Desailly, chief engineer of the Liévin Coal Mine in the department of the Pas de Calais, France, of the rapid and also final repairs made to No. 3 shaft of that colliery, after a shifting of the measures, which burst in the masonry lining, and loosened the cross-bearers to which the cage guides were attached. At the depth of 480 meters—1,574 ft.—this shaft passed through a fault, several meters or yards thick, forming an out-throw to the south of about 120 meters, and occurring in the form of a cleft, dipping about 50°, and containing very friable rock between its sides.

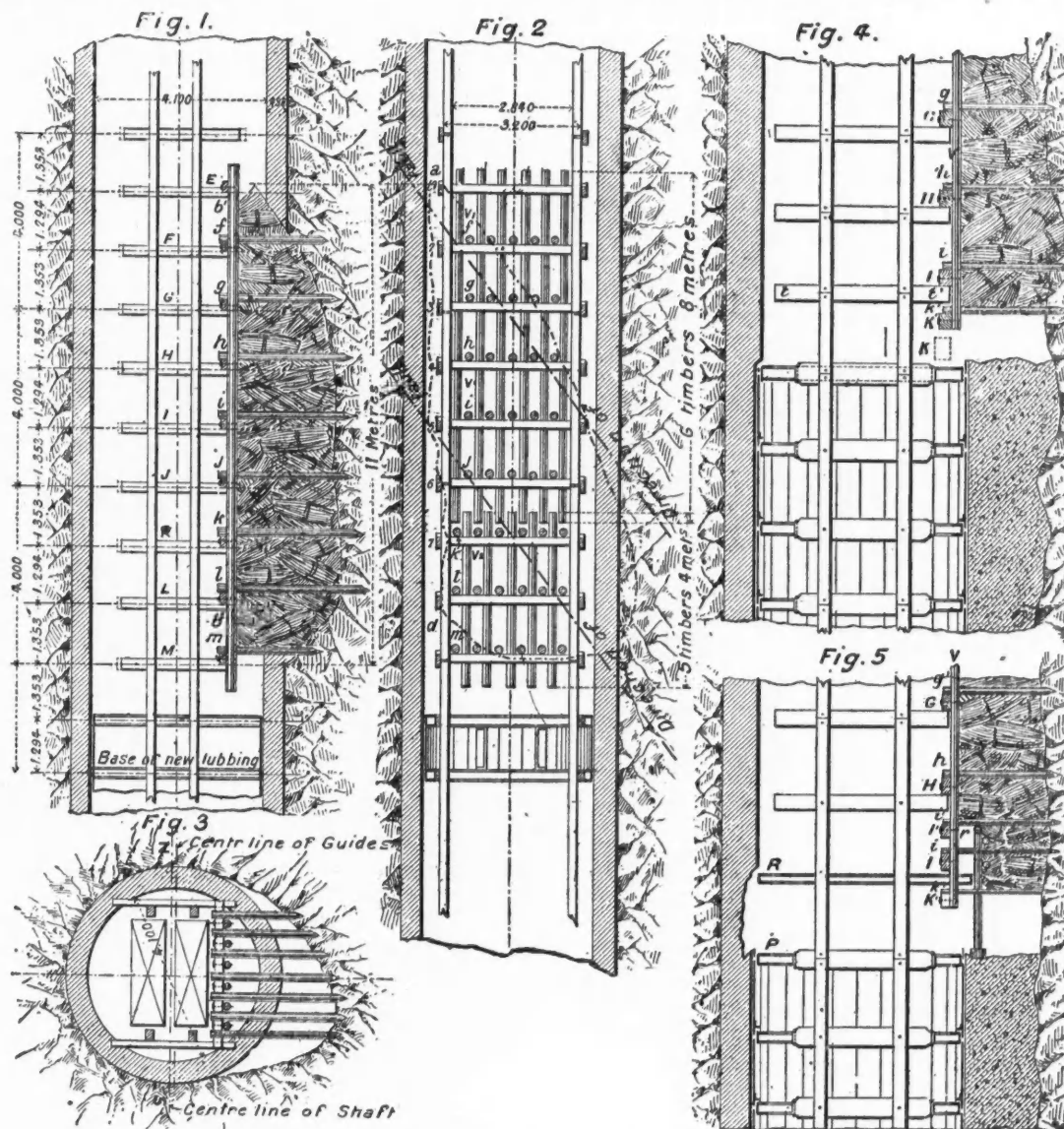
The effect of working begun at the level of 526 meters was to burst in the masonry lining of the shaft where it passed through the fault; and, notwithstanding all the consolidation works executed, the thrust of the measures caused the fall of that part of the lining, about 11 m. high, shown by the irregular dotted line *a b c d* in Fig. 2 of the accompanying sections, the horizontal section—Fig. 3—being taken along a plane where the fall was greatest. As the friable rock between the sides of the fault began to move it became impossible to go down and come up in the shaft. For avoiding accidents, the repairs were carried out downwards in the following manner.

Referring more especially to Figs. 1 and 2, which show vertical sections, at right angles to one another, of that portion of the shaft where

them with cement or concrete, as the case might be, according to the amount of space to be filled. The tubbing, which had already been used in another shaft belonging to the company, consists of a series of rings, made up of four channel irons connected by fish-plates, the rings, corresponding with the existing cross-bearers, being connected together by eight vertical channel irons, and covered outside by 24 plates bent to the outside diameter.

Referring now to Figs. 4 and 5, the first ring, serving as base, was laid on oak cleats let in the solid part of the masonry below the fall, great care being taken that the ring should be perfectly plumb. It was found necessary to take out the guide cross-bearers corresponding with this ring, and excavate the masonry, in order to form a place for the ring in which the new cross-bearers were fixed, the guides being bolted to them. The second ring was placed in the same manner; and the first and second rings were connected by eight vertical channel irons, the plates being added and the cement or concrete run in behind them.

The laying of the third and following rings was a matter of great difficulty, as it was necessary to make a place for each in the fallen rock; and this is how each ring was laid after the first two, Fig. 4 showing the state of the work after the completion of a ring P, with the concrete run in behind up to its level. Between the beams I and H, a strong horizontal timber, I—Fig. 5—was laid against the vertical timbers V V, etc., and firmly attached to them by wood screws, while the ends were wedged as tightly as possible against the solid parts of the masonry. From the top



REPAIRING WINDING SHAFT, LIEVIN COLLIERY, PAS DE CALAIS.

the fall occurred, the beam E was firmly fixed to the guide cross-bearers *t<sub>1</sub>t<sub>2</sub>* in the solid part of the shaft just above the fall, and six of the longest timbers, V V, etc., that could be found were let down and bolted to it about 50 cm.—20 in.—apart, the spaces between them being filled in by planks. These timbers permitted of placing in succession the beams F G H I, etc., until the bottom of the fall was reached, care being taken to bolt them firmly to the six vertical timbers V V, etc.

As the beams F G H I, etc., were fixed, a series of pointed poles, *f f*, *g g*, *h h*, etc., were driven horizontally into the fault, and covered with fascots pressed firmly against the rock. In this manner the fallen-in portion was divided into a series of distinct compartments, which greatly facilitated the final repairs. The temporary repairs, executed in two days, permitted of winding being resumed in the shaft, which was thus consolidated so that it might hold good for several months until the final repairs, carried out in the following manner, could be executed.

As it was now known that masonry lining could not be relied upon to withstand the thrust of the measures, it was decided to place a wrought-iron tubbing inside the existing masonry, and fill up the space between

of this beam, poles, or old mine rails *i<sup>1</sup>i<sup>2</sup>*, pointed at one end, were driven into the fallen rock, thus constituting a series of divisions, like those formed by the horizontal timbers in the temporary repairs, so that the strain upon those timbers was reduced.

The old guide cross-bearers, *t, t<sup>1</sup>*—Fig. 4—were then taken out, when the beam I was held in place by the vertical timbers V V, etc., to which it was bolted, care being also taken to further support it by struts as shown in Fig. 5. The space was first cleared between the levels *i<sup>1</sup>i<sup>2</sup>* and *k<sup>1</sup>k<sup>2</sup>*, when it became possible to push forward the vertical timbers V V, etc., for a distance of 65 to 80 cm.—mean 2 ft. 4 in. As a precautionary measure, a horizontal timber, *r*—Fig. 5—was inserted below the level *i<sup>1</sup>i<sup>2</sup>*, and maintained by uprights resting on the last ring P, laid on the solid part of the shaft. It was then possible to place the next ring R in the space thus made in the fallen rock, Fig. 5 showing the state of the work at this period. The last-named ring, R, was connected to the one below it by eight vertical channel irons; and the plates were laid, being surrounded by concrete as described above. Lastly, for terminating the concrete work, the remainder of the fallen rock was carefully cleared away be-

tween the levels  $i^1 i_2^1$  and  $k^1 k^1$ . The beams  $I^1 K^1$ , and the horizontal timbers  $i^1 i_2^1$ , etc., were taken out, and the vertical timbers V V, etc., cut underneath the beam I, when the same operation was repeated for laying a fresh ring.

The part of the shaft fallen in was thus entirely repaired by a lining 16.2 meters—18 yards—high, consisting of 13 rings, including that at the base, and the work was carried out without any interruption to the winding every day after the men had come up, and also when the shaft was idle, having been completed in two months from the commencement. Notwithstanding a strong thrust of the measures while the fifth ring was being laid, the work was crowned with success, thanks to the intimate connection of the three sets of timbers, namely the verticals V V, etc., the beams E F G H, etc., and the cross-bearers,  $t_1 t_1^1$ ,  $t_2 t_2^1$ , of the guides.

#### ABSTRACTS OF OFFICIAL REPORTS.

##### Philadelphia and Reading Coal and Iron Company.

The report of this company for the fiscal year ending November 30th, gives the following statement of financial results:

	1894.	1895.
Gross earnings	\$22,236,864	\$24,040,749
Expenses	21,968,311	21,780,608
Net, or deficit	N. \$268,553	D. \$699,809
Interest charges	1,294,155	1,176,182
Deficit	\$1,025,602	\$1,875,991

The expenses in 1895 included \$584,450 paid for permanent improvements in the company's collieries.

As the Coal and Iron Company did not earn its operating expenses, it became necessary for the Railroad Company to advance to it \$656,270 to pay so much of the interest as is guaranteed by the railroad company.

The production of coal from Reading's lands was 8,633,214 tons, an increase of 575,171 tons over 1894. The coal cost \$1.414 per ton delivered in cars, or, after allowing \$584,450 for permanent colliery improvements, which increase the productiveness of the estate, it cost in cars \$1.339 per ton, which is less than in any year since 1879. The decrease was largely due to economies resulting from steady working, and to lower cost of labor and materials.

The collieries are in exceptionally good condition. Coal sales for the year aggregated 8,921,850 tons, an increase of 969,486 tons over 1894, heretofore the largest on record. The sales having exceeded production, the stocks of coal on hand were reduced accordingly. Sales of coal aggregated \$23,660,505. The coal business resulted in a loss of \$699,809, being 8.1c. per ton of coal mined, or 11.4c. per ton worse than 1894.

During the year 1,000 new 30-ton coal cars were bought. The old coal cars of small capacity are going out of service so rapidly, many of them being over 20 years old, that considerable increases in coal equipment must be made in the near future.

An important improvement has been made at Mahanoy Plane, where the old boiler plant, which was inadequate for the duty required, and which consumed a great amount of pea coal, was replaced by boilers of modern type, which do the work much more efficiently with smaller coal, which only costs 30% of the price of pea coal.

The marine equipment, which is engaged in carrying coal from Port Richmond and Port Reading to the ports on the North Atlantic Coast, found steady employment during the year, and, though ocean freight rates ruled lower than ever before, the fleet made a handsome profit. Some additions are now being made to accommodate increased business, six new barges of 1,000 tons capacity each, and one powerful ocean tug having been contracted for and mostly completed.

The report gives a historical summary of the position of the Reading in the coal trade, this having special application to the question of the share in the trade to which it is now entitled. It also refers at length to the negotiations last spring for a settlement of the troubles in the anthracite trade and their failure.

#### THE ORISKANY IRON ORES AT RICH PATCH MINES, VA.

Written for the Engineering and Mining Journal by Edmund C. Pechin.

(Continued from page 113.)

The present mining operations at Rich Patch are confined to a small compact area, immediately adjoining the Low Moor property. The openings are respectively Nos. 1, 2, 3, 4, 5 and 6. All of these are in the foot hills of Horse Mountain, on its southern slope. These take the shape of rounded buttresses jutting out from the main mountain, and giving out shortly before reaching Karnes Creek. Narrow washouts or ravines lie between these, affording excellent opportunities for attacking the ore at the surface in these ravines; the ore has of course been washed away, but everything points to an unbroken lead at the lower levels.

No. 1 was first worked as an open cut. Subsequently a tunnel was driven 120 ft. through dead ground, striking the ore lying at an angle of 35° S. S. E. The main gangway has been driven in the ore 1,000 ft. There are five levels, each 24 ft. apart, connected by winzes with the main gangway. The upper level is now being robbed, and the width of the lense of ore at this point is from 60 ft. to 80 ft. At no place was it less than 30 ft.

No. 2 is about 1,000 ft. from No. 1. There has been a local disturbance at this point, as the ore stands nearly vertical—indeed at spots leaning slightly to the north. This was also started as an open cut, but the ore here will all come out through No. 6, as will the ore in the lower levels of No. 1.

No. 3 has been worked first as an open cut, and now by tunnel, and very plainly shows the characteristics of the Oriskany ore in its thinnings and thickenings, but an average of 25 ft. in width was and is had. With increasing depth it is thickening, with its dip constantly changing.

No. 4 has not been worked on a very extensive scale. In the open cut at the northeast end, the ore near the surface is considerably mixed with clay, and with so much good ground available, and the demand limited,

the work was very properly suspended; at the southwest the ore ground was about 25 ft. The large and important piece of work, No. 5, is where the great ore bluffs formerly stood, and which gave many thousands of tons of lump ore.

A tunnel has been driven 300 ft. through the hill, striking the ore at a right angle. Two gangways have been driven with the strike, one to the right 800 ft., with 250 ft. of ore to the outcrop over it, and the other to the left 600 ft., with 200 ft. to outcrop. The ore is massive throughout, giving, in addition to the lump, wash ground of extraordinary richness, say 80%. Indeed, much of it, by passing it over screens, could be loaded unwashed. In these drifts the ore has never shown less than 20 ft. and up to 45 ft. in width.

No. 6 is by far the most important bit of work undertaken, as it not only opens up very extended workings on the great lead thus far considered, but has proved the existence of the great parallel lead first found on the Low Moor ground. It is a double track tunnel, driven under No. 2 open cut at a depth of 200 ft. under original outcrop. Sixty feet of open cut in a ravine brought the work to sand rock—then 415 feet of tunnel through a sort of soapstone. Shale to the sand rock wall of 12 ft. Behind this was the first lead of ore (that which has hitherto been worked), 45 feet of solid to what was supposed to be the foot wall, but there being no sign of the black flint, only a bluish shale and clay, the work was pushed ahead by a monkey tunnel; 80 ft. of this stuff was encountered, and then a sandstone of 6 ft.; behind this 55 ft. of massive ore ground, and then the black flint which is everywhere recognized as the true foot wall. That these two great seams of ore should have been originally one, doubled up on itself, seems impossible from the condition of the sandstones, and from the apparent absence of any disturbance.

The tunnel is a fine piece of work, heavily timbered with sawed oak, until the ore is reached. This was the only thing to be done, as this tunnel must be the working outlet for unnumbered tons of ore from under Nos. 1, 2 and 3. There are six levels 24 ft. apart above the gangways, which run in both directions, to the right and left. These levels are in different stages of progression, connected by winzes, and robbing is only going on in the upper level of No. 1. A very large area is in shape for a heavy output, the demand arising.

At this writing, the main gangway is only 300 ft. to the northeast, while the property line in this direction is quite 3,000 ft. distant. That to the southwest is in about 180 ft. and the work on each being rapidly pushed.

I did not measure it, but I should say that this tunnel is not over 600 ft. from the washing plant, with which it is connected by a slight descending grade.

Nature rarely gives an absolute "soft snap" to anyone. To the owners of Rich Patch she has given untold quantities of ore of first-rate quality and easy to mine, but on this part of the property at least she has partly "slipped up" on an adequate water supply, especially with seasons like the last two. There is enough water to take care of, say, 300 to 400 tons a day, but to get above this some additional supply must be had during the late summer and autumn months. Both Karnes and Raleigh Creeks are torrents at certain seasons of the year, but rapidly dwindle as the season advances. The company are now sinking an artesian well, from which an ample supply should be obtained. This failing, a pipe line from the Jackson River, about three miles distant, would solve the problem. On the southerly 4,000 acres, which can be reached through the gorges of Mill Branch and Laurel Run, this difficulty will not arise, as Mill Branch is a bold stream fed entirely by springs, and, at the time of my visit, running a volume of water ample to take care of extensive mining operations. The washing plant is well located in the center of the camp, both for receiving the raw ground and delivering the washed ore into cars, everything working downhill. The washer is a Copeland & Bacon revolving barrel, with the Merry picking belt, the latter the very best appliance for handling this class of ores I have ever seen. This washer will turn out 200 tons of washed ore a day. The steam plant and building are of sufficient capacity to take care of two washers, and a second is now building, and will be shortly completed. These with the lump will give a daily output of, say, 500 to 600 tons of ore anyhow. Since my last visit a decided improvement has been made, getting a much higher duty from a given volume of water and cleaner ore, by dumping the wash ground into steel troughs, into which the water is flushed some 50 feet away from the washer. In traveling this distance the clay is softened, loosened and abraded, so that little is left for the washer proper, save a final cleansing.

The company have built 4 $\frac{3}{16}$  miles of standard track, which joins the Chesapeake & Ohio Railway one mile west of Low Moor. The service on this road is by a heavy Baldwin engine. The equipment of the mines is ample and the whole camp bears evidence of careful oversight and management. It is proposed to introduce electric haulage in the mines at an early day.

The ores as shipped are first-class Oriskany brown hematites. In selecting samples for analyses, the general manager, Mr. C. M. Shanahan, tells me that they take especial care to secure an average, the samples being taken at random from the cars as they stand under the washer. Determinations running over many months were as follows:

	Iron.	Silica.	Phos.
An average of 12 gave	46.34	.....	.....
An average of 16 gave	47.84	.....	.277
An average of 14 gave	46.58	19.42	.....
An average of 12 gave	50.32	13.27	.....

The above were selected as fairly representative.

While I have not personally inspected the records, I was told on excellent authority that the last month's run of the Buena Vista furnace, now leased and operated by the Rich Patch Company, and averaging over 100 tons a day, chiefly foundry iron, 2 $\frac{1}{2}$  tons of ore gave 1 ton of iron.

Mr. Johnson, the well-known manager at Longdale, some time since advised me that his ore averaged for the year in the furnace 48% of iron. A noteworthy fact connected with the Rich Patch ores is the absence of manganese, an objectionable feature in some parts of the Oriskany field. In a number of samples above taken, manganese only showed .346, and as a rule was below this. In one sample phosphorus stood at .927, but a fair average can be placed at .50.

(To be concluded.)

## CAPITAL AND LABOR.

By R. H. Hadfield

We have received the following interesting communication from Mr. R. H. Hadfield, on the subject of bringing about a working basis between capital and labor, in which he gives us the result of his extensive experience, and that of his firm, spread over many years in this particular direction at their well-known steel works in England. Mr. Hadfield says:

From my own experience in metallurgical discussions I have often found two apparently very dissimilar expressions of opinion, when thoroughly investigated and analyzed, have much the same end in view, so it often is in the struggles between capital and labor. I strongly believe that the different points of view between capital and labor do not, when analyzed, possess such a divergent aim as to give rise to the internecine struggles that now disgrace modern times. In other words, that if it were possible to get together employers and employees on a better and more friendly footing, a large proportion of the friction now experienced might be avoided.

The foregoing represents briefly my own views of the situation, the grounds for which I will give further on when mentioning my own experience.

I was first actively brought in touch with labor matters about eight years ago in connection with a dispute at the works of my firm, Hadfield's Steel Foundry Company, Sheffield, England. It did not concern rates of wages, in fact it was one of those disputes that often give rise to the most severe struggle, that is, the question of management. Our general manager wished to introduce a set of rules, a sort of Code Napoleon, for the internal government of the works. They were not specially arbitrary, but among them some of the conditions caused considerable irritation to the employees, and, after several unsuccessful attempts to settle the disputed points, it became necessary for me, as president of the company, to receive deputations, or a strike involving between five hundred and six hundred men would have occurred. After carefully investigating the whole matter I became fully convinced that we had been unreasonable, the objectionable features were therefore removed and the strike averted. As a matter of fact, this entire set of rules to be enforced, and which were then modified, have been since consigned to the limbo of the forgotten. This has certainly resulted in no loss to the firm, while I think it has added much to the personal comfort and even dignity of the employees. Apart from this, for over 25 years we have never had the slightest trouble of any kind with our workmen, representing engineers, fitters, foundrymen, melters, laborers, etc. My experience at the time named convinced me that in nine cases out of ten, by the two sides coming together and being willing to discuss matters a little outside the lines of "meum and teum" most labor disputes could be prevented. Whether the tenth case could be avoided rests much upon the line of thought taken up in the directions indicated by the following remarks. But to prevent the "tenth" it does appear to me absolutely necessary that employees and employers should meet from time to time, not when disputes are under consideration and friction exists on both sides, but when a fair-minded and unprejudiced consideration can be given to the various questions concerning the improvement of the workers' position, which the very essence in modern evolution and progress renders necessary.

It is for this reason that I have been actively interested in the formation of an organization on the other side which has received the name "The Industrial Union." This society aims at securing members from the ranks of both employers and employees, so that congresses can from time to time be held both locally and at some central seat. In other words, it would be the parliament or congress where both sides of the "Capital and Labor" question could be heard, and chiefly at times when no bad blood had been drawn or troubles actually in sight. Speaking from my own experience, I can say that it has already brought me very pleasantly in touch with men representing the labor side and of whom until that time I had profound distrust, but upon a closer examination their aims were not found to be of that unreasonable character for which they usually receive credit. Nor are these aims revolutionary or likely to disturb the just reward of capital if those representing the latter are willing to be fair-minded and not believe that the essential in life is to be devoted to the extraction of the full pound of flesh. In other words, that capital has its obligations instead of its rights.

The council of this union, equally divided between capital and labor, includes influential men like Sir David Dale, Mr. W. Whitwell, M. P., on the one side, and on the other moderate labor leaders like Messrs. Trow, C. Hobson and Johnstone.

The aims of the society are to go gradually "festina lente"; we don't expect to do more than touch the surface of the problem of "how to bring about a better feeling—the *entente cordiale*—between the two international camps of modern times."

In submitting the foregoing the writer does not wish it to be thought that the problem to be solved here is of exactly the same character as that on the other side. For example, as regards the amount of wages there is no doubt that a worker here is better off than in England and much better off than those on the continent. Whether the wages earned will go as far as in England is another and more debatable point which it is not necessary to enter into here, but I do think that while wages are higher here, there is too much driving and that too much is often expected from the worker. It is, no doubt, the necessary outcome of the extremely high pressure on this side and not that employers do not consider the comfort and conditions of their employees. Then, again, the question of piece work is probably overdone. In the hands of fair minded employers piece work may be indirectly good for both employer or employee, but there are often to be met, whether in England or America, employers who seem to glory in exercising "the squeezing of rates" to such an extent as to make them the best possible advocates for the extremest and the labor party.

My own experience is that the apportioning of piece work requires most delicate handling. If a shop is properly equipped, organized and well managed by its foremen, I question very much whether piece work possesses that advantage commonly believed. So long as we are all on the same footing I am in some ways glad that the labor unions have in my district in England taken this matter out of the hands of the

employers as regards a considerable portion of foundry and machine shop piece work. All unionist workers in the district who represent 95% of the skilled labor (the unskilled and non-unionist labor is nearly always dear at any price), are therefore on the same footing. Nor do I think this has affected us seriously in our competition for work, nor that of other firms in the same district. It should always be remembered that this is qualified by the conditions before referred to, namely, that the shop should be run by competent foremen able to organize, lay out and arrange the work to the firm's best advantage. I have never found labor unions to throw obstacles in the way of cheapening production so long as the attempt was made on fair and reasonable lines and they certainly encourage the production of the best work of its kind as well as the evolution of the best class of employee. In my own works I do not think, notwithstanding the cessation of piece work in much of our work where those called "journeymen" (that is, full blown engineers or molders), are employed, paying insurance fees, shorter hours, to which I will refer later, and other points, that our costs have been increased so as to put us outside competing for our usual class of work.

From the foregoing it will be seen that I do not consider unions are the bugbear some do. Of course there are often stupidity and ignorance, perhaps met with more in England than here, but this is only the *more reason*, it seems to me, for at any rate attempting to remove by friendly intercourse that want of knowledge on their part both regarding economical and financial conditions, technical knowledge and general progress. Therefore all the more reason that employers and employees get in friendly touch. Our own experience has been that the latter are not so impervious to efforts in this direction as is so commonly supposed. At any rate, from the lowest of motives, though the strongest with us all, it is worth while making an attempt to remove the prejudice and misunderstanding now existing and which can only be done by coming in personal contact. The conditions of modern business, that is, the working conditions, tend to drive wider apart employer and employees. Each of us has more to do, and this applies equally to the workers, and the conditions generally are more complex. Hence we go blindly on, in the main through no bad intention on either side, until the usual impasse occurs, when all the bad side of human nature, much alike whether in an employer or an employee, comes to the surface. Who in a large industrial establishment is personally acquainted with half a dozen of his employees? We employers are too apt to treat them as mere machines with the usual result that there is a break down, principally arising through want of lubrication. Hence, it seems to me, the necessity of organizations such as I have before referred to—in other words, somebody composed of representatives from each side when opportunity should be given of meeting together for friendly discussion and the like. Trades unions, as we call them, while having their weak side, are, in my opinion, in many ways beneficial to the community, and not least to those employers who endeavor to treat the labor question from a broad and friendly standpoint, and surely such a standpoint must in the long run, even when regarded from the lowest, prove the most economical, when one considers the enormous loss in time, money and energy wasted in strikes.

Speaking of labor unions in England, those of the standing such as the Amalgamated Society of Engineers, Molders Association and many others, of which I presume there are duplications on this side, an immense amount of good is done by them in fostering that independence of character so much appreciated by all classes here, self-respect; also providing, quite apart from strike pay for out-of-work members, sick relief, funeral or death benefits, accident funds and many other aids or help to the employees themselves, which by the bigoted capitalists are entirely ignored.

Speaking of my own particular experience as to forward movements, the following may be of interest: We have now in our establishment about 500 to 600 employees and have been successfully working for about two years on the 48 hours week. Originally our week's work consisted of 54 hours' time, that is, each day's work was supposed to commence at 6 a. m. From 8:30 to 9 a. m., here was then an interval of a half hour for breakfast, an hour for dinner between 1 and 2 p. m., work ceasing at 5 p. m., and after that hour, time and a quarter wages were paid, that is, 25% advance on the usual day rates.

As a matter of fact, and especially in winter, many of the employees were not at their post by the opening hour, 6 a. m., the foreman came in irregularly, no matter how strict a supervision was attempted. The amount of attention paid to the preparation of breakfast while on duty no doubt cost the firm the unknown or a quantity! Four years ago, therefore, the experiment was made of reducing the time to 51 hours per week, and as this did well, we then gave 48 hours time, as well as putting all labor of whatever kind, that is, skilled or unskilled, on exactly the same footing as regards the payment of over-time, the extra rates having previously applied only to the employees connected with labor unions. By the way, rather an indirect proof that employers usually only give what they are compelled to do, and thus strongly supporting, though probably they do not think so, the very objects of the fighting party on the labor side, I may incidentally say that this action of ours, that is, of putting the unskilled employees, over whose protection the agit of a union did not extend, upon exactly the same footing as the unionists, gave great satisfaction, and while one does not expect any actual gratitude, yet I do think that our employees have in many ways made up to us whatever we might have lost by this change.

The employees now come to work at 7:40 a. m., after having had their breakfast, work until 12 noon, one hour is taken for dinner, ordinary work ceases at 5 p. m., and on Saturday at 12 noon. There is thus a half holiday on Saturday afternoon, but, as you are probably aware, this is the usual practice throughout my country.

Another concession which has been much appreciated has been in connection with our insurance fund. Until about a year ago our employees paid about one-third of the total amount for their accident insurance fund, but we now give a free insurance. This covers any liability against any fatal accidents, which means that the relatives of the deceased get \$500, or in case of accidents one-third to one-half of the current weekly wages until health is restored.

Speaking generally as regards the reduction in the number of hours, a question which is fully discussed in the little work written by Mr. H. De Gibbons, one of our social economists and myself, entitled "A Shorter Working Day," while my firm cannot, of course, draw strict compari-

sons or make absolutely definite conclusions, we feel confident that the change has been made at but little loss to the firm. Punctuality of the hour of starting, that is the commencement of hard work throughout the works at one particular hour, is in itself a saving. No late comers are allowed, and not only the foreman, but the managers themselves, are in their places, which means many incidental savings.

While I am aware that "one swallow does not prove a summer," I think that similar action in this direction taken by other firms in my country all go to prove that a consideration of other facts not hitherto considered as being business ones can be safely introduced in the working in modern industrial establishments. At any rate, these questions are in the air and have probably come to stay; thus the experience of any one firm who have made the experiment may be of service and lead to the more general consideration of this question.

I should like to conclude by saying that my own firm can only sustain its position in the particular branch of industry in which it is engaged by being able to meet the most intense conditions of modern competition, both as regards quality and price.

#### THE INTERNAL TEMPERATURE OF R. CKS.

For several years past (says Professor Agassiz, in a communication to the *American Journal of Science*) I have, with the assistance of our engineer, Mr. Preston C. F. West, been making rock temperature observations as we increased the depth at which the mining operations of the Calumet & Hecla Mining Company were carried on. We have at the time of writing attained at our deepest point a vertical depth of 4,712 ft., and have taken temperatures of the rock at 105 ft.; at the depth of the level of Lake Superior, 655 ft.; at that of the level of the sea, 1,257 ft.; at that of the deepest part of Lake Superior, 1,663 ft.; and at four additional stations, each respectively 550 ft., 550 ft., 561 ft., and 1,256 ft. below the preceding one, the deepest point being 4,580 ft.

We propose, when we have reached our final depth, 4,900 ft., to take an additional rock temperature, and to then publish in full the details of our observations. In the meantime it may be interesting to give the results as they stand. The highest rock temperature, obtained at a depth of 4,580 ft., was only 79° Fah.; the rock temperature at a depth of 105 ft. was 59° Fah. Taking that as the depth unaffected by local temperature variations, we have a column of 4,475 ft. of rock with a difference of temperature of 20° Fah., or an average increase of 1° Fah. for 223.7 ft. This is very different from any recorded observations; Lord Kelvin, if I am not mistaken, giving an increase for 1° Fah., 51 ft., while the observations based on the temperature observations of the St. Gothard Tunnel gave an increase of 1° Fah. for 60 ft. The calculations based upon the latter observations gave a thickness of the crust of the earth, in one case of about 20 miles, the other of 26.

Taking our observations, the crust would be over 80 miles, and the thickness of the crust at the critical temperature of water would be over 31 miles, instead of about 7, and 8.5 miles as by the other and older ratios. With the ratio observed here, the temperature at a depth of 19 miles would only be about 470°, a very different temperature from that obtained by the older ratios of over 2,000° Fah. The holes in which we placed slow registering Negretti and Zambra thermometers were drilled, slightly inclined upward, to a depth of 10 ft. from the face of the rock, and plugged with wood and clay. In these holes the thermometers were left from one to three months. The average annual temperature of the air is 48° Fah.; the temperature of the air at the bottom of the shaft was 72°.

**Electric Boring.**—Messrs. Siemens & Halske, of Berlin, have recently secured a contract for an electric boring plant for the State salt mines at Hallein. The plant will comprise a high-pressure turbine coupled direct to a continuous-current dynamo and two boring machines.

**Reinforced Steam Pipe.**—A Scotch engineer, Mr. Smillie, has invented a new steam pipe, capable of withstanding extremely high temperatures. He winds a close coil of steel wire about a copper tube and solders the whole firmly by immersing the steel-wound pipe in a fusible alloy, which has a melting point above the temperature of the steam which it is to convey.

**Wire Flywheel.**—The Mannesmann Tube Company (Germany) has built for its works a huge wire flywheel. It is described as being formed of a cast iron hub or boss, to which are attached two steel-plate disks or cheeks, about 20 ft. in diameter. The peripheral space between the disks is filled in with some 70 tons of No. 5 steel wire, completely wound around the hub, the tensile resistance thus obtained being found to be far superior to that of any casting. This huge flywheel is driven at a speed of about 240 revolutions per minute, giving a peripheral velocity of 2.8 miles per minute, or, approximately, 250 ft. per second.

**Electric Transmission of Water-Power in Mexico.**—Manuel Fernandez Leal, Sec. Dep. Fomento, in behalf of the Executive, is reported to have entered into a contract with W. Breckman, representing Siemens & Halske, of Chicago, Ill., for the transmission of water-power to the City of Mexico from the falls in the municipality of Tenancingo. The concessionaires agree to utilize the hydraulic force produced by the falls of San Simon Atlocomuico and Achayatlá for the purpose of generating and transmitting electrical energy to Mexico, the Federal district and neighboring States.

**English Pig Iron Production.**—The production of the Cleveland district in England for the year 1895 amounted to 1,440,206 tons foundry and forge iron, and 1,476,233 tons Bessemer pig, a total of 2,916,439 tons. This compares with 2,963,419 tons in 1894, and 2,724,184 tons in 1893. The stocks of pig iron at the close of the year showed an increase of 75,006 tons over 1894. The output of the Scotch furnaces in 1895 was 1,096,912 tons of pig iron, against 655,614 tons in 1894, when production was almost stopped for some time by the great coal strike. Stocks of Scotch pig, December 31st, 1895, were 480,624 tons, an increase of 122,025 tons during the year.

#### THE AMALGAMATION OF RICH FREE GOLD-ORES.

Written for the Engineering and Mining Journal by F. Hille.

This is the title of a little pamphlet by Wilh. Venator, of which an extract may prove of interest not only to those owning reduction and sampling works but also to many mining engineers and chemists, considering the difficulty encountered in making correct average tests of rich free gold-ores. It will be undoubtedly of special interest to the owners of those mines in which pockets of rich ores are met with. As, for instance, in some of the Transylvania mines, among them the Maria-Stollen in Muszari, near Brád, where in 1891, in a comparatively small portion of the vein, 127 lbs. of free gold were found, and lately in the Rudolff Mine at Boicza, where in a short time 350 lbs. of free gold and a large quantity of other rich minerals were taken out. In shipping these ores to the reduction works a constant friction and dispute would arise out of the different results obtained in testing, and it will be of not less importance to sampling works to diminish the great risk in buying such rich ore.

The process in Transylvania was for many years the mortar and pesle amalgamation. This was not only a very costly but also a very tedious affair. Twelve men and three overseers could amalgamate only about one ton in five shifts, and a heavy loss in quicksilver was always experienced.

Mr. Venator says: "For many years I was occupied with quantitative amalgamation tests of various ores from Transylvania, North America, Mexico, etc., for the purpose of determining the amount of free gold, besides that part combined with other minerals. The mortar amalgamation gave incorrect and irregular results. Besides agitation in pans I tried also a little ball-mill manufactured by the Fred Krupp Gruson Works in Magdeburg-Buckau, Germany, made of cast steel, in which a number of steel balls of different diameter revolve (Fig. 3). The amalgamation with this mill gave very satisfactory results. The quicksilver comes in close contact with all particles of the ore, without being divided into minute globules, and the separation from the pulp offers, therefore, no difficulty whatever. The pressure of the slow rolling and sliding balls, and the form of the shell of the mill, seem to be very favorable to the amalgamation, and also to hasten it.

After many laboratory tests, with very uniform results, I made the proposition to the mining superintendent, L. Venator, in Boicza, to use

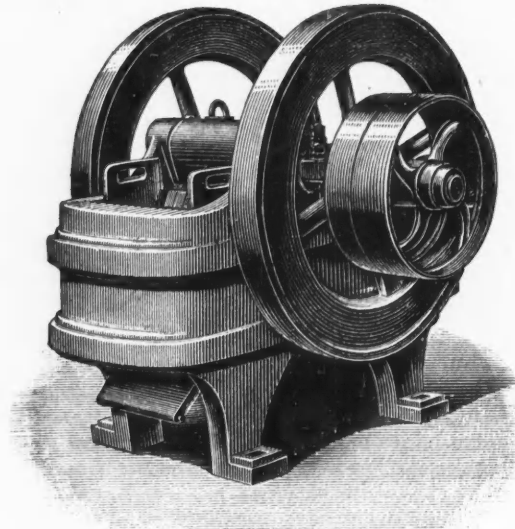


FIG. 1.

these ball-mills for making tests on a larger scale. The latter proved so satisfactory in regard to expenses, reduced loss of quicksilver and saving of gold, that the first Transylvania goldmining company soon ordered a complete plant from the Fred Krupp Gruson Works, and has experienced since that time a considerable reduction in expenses. Compared with the mortar amalgamation these were about \$65 per ton of an ore containing 2.2 lb. to 22 lbs. of gold, while with the new process only \$6.20. The loss in quicksilver is reduced from 22 lbs. to 2.2 lbs., and the gold and silver in the tailings from 16 and 19 oz. to 3.2 and 4.9 oz., and consist now merely of that part which is combined with other minerals, and is not amalgamable.

\*The plant in the works in Boicza in use consists of

One Gruson crusher, No. 2 (Fig. 1).

One " ball-mill, No. 1 (Fig. 2).

Two closed ball-mills (Fig. 3).

Two (one set) Laszlo amalgamators (Fig. 4) for separating the amalgam from the ore.

These machines are erected in a special room, where they are attended to by an overseer and a boy. The driving power is very small, hardly worth considering. Meddling with the amalgam is avoided by keeping the mills under lock and key. After the dry ore is crushed it is fed automatically into ball-mill (Fig. 2), which is surrounded by a sieve of No. 80 wirecloth. The fine pulp is then fed into the two little ball-mills in quantities of 30 to 33 lbs. each, and enough water is added to give the pulp a consistency of honey. The next charge is the quicksilver, 4½ to 5 lbs., according to the richness of the ore, after which the 8 to 10 steel balls are added, the covers put on the mills and hermetically closed with a suitable packing. The mills are run for about 2 to 2½ hours, at about 20 to 22 revolutions per minute, after which the amalgamation is finished. The covers are taken off, the balls carefully removed, and the tailings resting on top of the amalgam skimmed off with suitable little shovels. The largest proportion of the amalgam rests free of ore on the bottom of the mills; this is taken out, pressed through chamois skin, while the pulp,



with some of the amalgam, is transferred into a Laszlo amalgamator (Fig. 4) and therein automatically separated. This latter work is also accomplished with a so-called amalgam cleaner (Fig. 5) in which the pulp, with a supply of water, is stirred until all the amalgam has settled to the bottom, whence it can be drawn off, while the tailings run off through openings in the sides of the apparatus and are collected in settling boxes, whence they go to the dressing works.

About 450 lbs. of rich, free gold ores can be treated per shift with the above-described little plant, and it will prove sufficient for most of the mines because this amount is rarely reached per shift.

The following expense account will allow a comparison between the ball-mill and mortar amalgamation, as experienced in Transylvania:

I. Ball-mill Amalgamation.		II. Mortar Amalgamation.	
1 overseer, 5 shifts, a M. 3.20, M. 16		3 overseers, 5 shifts, a M. 3.20, M. 48	
1 boy, " " " .963, " 4.80	24 men.	5 " " " 1.60, " 192	
1 Ko. quicksilver, " " 4, " 4		5 Ko. quicksilver, " " 4, " 20	
Total M.,	24.89 per metric ton	Total M.,	260

As already mentioned above, this ball-mill is very suitable for quantitative tests for the determination of the free gold, besides that part combined with other minerals. After all the free gold is eliminated from the

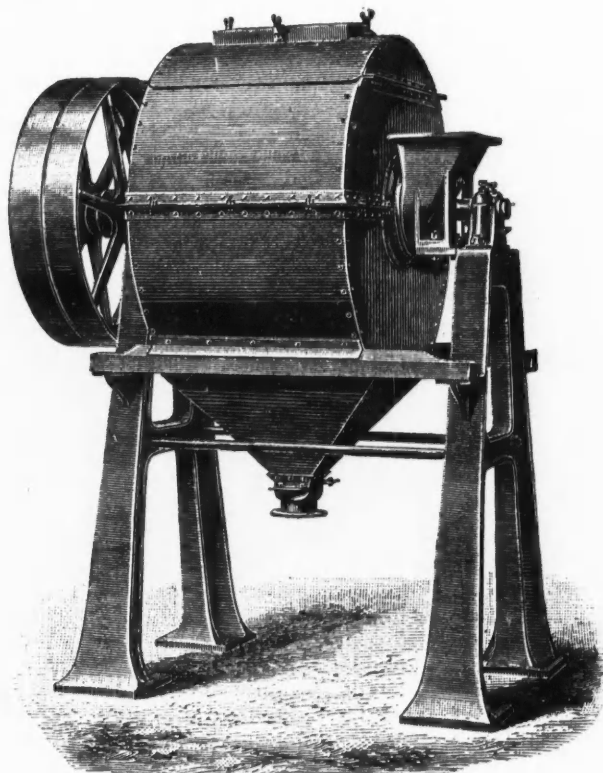


FIG. 2.

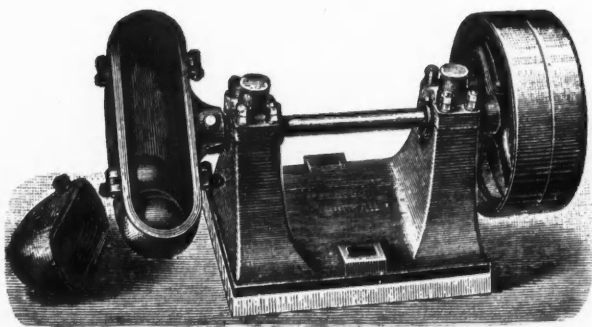


FIG. 3.

pulp it is possible to take good average samples for the fire tests, and so arrive at very reliable results of the whole amount of gold in any ore. Such determinations are not less useful in case of poorer ores, because through such tests it is possible to find out more readily what kind of treatment should be used for any class of ore. The small weight and size of the plant and the little power necessary make transportation easy and therefore suitable for those wishing to determine the value of a newly opened mine. Mr. Venator draws also attention to the use of the ball-mill for silver and gold skimmings, residues and for grinding up crucibles in mints, assay offices and reduction works, also the amalgamation of larger quantities of chloride of silver is facilitated, because the steel balls, which are always clean and bright, would soon reduce the chloride of silver and amalgamate the free silver.

I might add here, further, that there, where the gold is covered by films of any oxidation, products of Fe, S, As, Sb & Te, these ball-mills can be very advantageously adopted because the gold particles are polished clean

from any adhering foreign substance which would render the amalgamation impossible or incomplete. This is often found with gold coming from the oxidized zone of the veins, and especially with coarse gold having a bell-shaped or convex form. In these depressions or cavities the above-mentioned impurities are often tenaciously retained.

COAL IN PORTUGAL.

Very little has been done in Portugal in connection with coal mining, not because the country is destitute of coal, but largely on account of the protective policy of the government which imposes heavy duties all round, thereby crippling industry and discouraging enterprise. From the results of superficial observations there is little doubt that a systematic and thorough exploration of Portugal would lead to the opening of coal and other mines, to the material benefit of its trade and commerce.

There are three distinct coal-deposits in Portugal. In the north, near Oporto, anthracite coal of good quality occurs, but it is often so mixed with shale as to render the working difficult. The principal mines are: St. Pedro da Cora, Passal de Baioco, Covello and Midors Pegas. The large coal extracted from these mines is used in Oporto in cooking-ranges and stoves, and the small coal is made into briquettes for the same purpose.

Near Busaco, at Santa Catherina, there are seams of a semi-bituminous coal, but they are not now being worked.

Near the town of Batalha, which is situated 60 miles north of Lisbon and 12 miles south of the Oporto & Lisbon Railway, at Leiria, there is a coalfield extending to 1,200 acres, where the outcrops of several seams of coal have been located, and a few drifts made to prove them toward the dip.

Two adit-levels, about a mile apart, have been driven into the breast of a range of hills several hundred feet high. No. 1 mine, near Batalha, cross-cutting to the dip, has intersected four coal seams. The first seam lies at an inclination of 49° toward the east, while the others are inclined at from 25° to 30° toward the west. The first coal seam, 6 in. in thick-

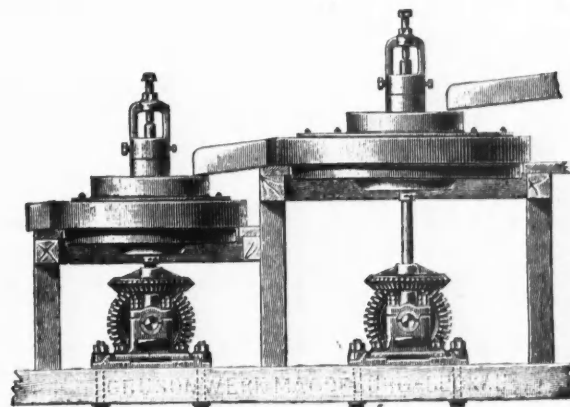


FIG. 4.

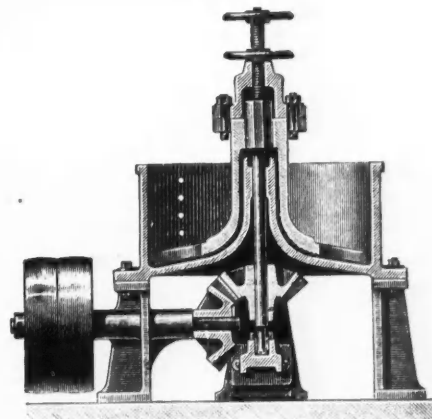


FIG. 5.

ness, of good quality, and having hanging and foot walls of hard blue clay, does not appear to form one of a series of stratified beds overlain unconformably by the other beds, but strikes across the strata. Possibly it may be in the line of a dip fault. The other seams have the following sections:

No. 1 coal seam.		No. 2 coal seam.		No. 3 coal seam.	
Marl roof.		Shale roof.			
Coal.....	0 6	Coal.....	1 4	Coal.....	1 0
Shale.....	1 8	Marl.....	0 6	Shale.....	1 0
Coal.....	1 4	Coal.....	0 6	Coal.....	0 6
Shale.....	1 0	Clay.....	0 6	Fireclay pavement.	
Coal.....	0 6	Coal.....	0 2		
Fireclay pavement.		Fireclay pavement.			

The coal in these seams has the appearance of lignite rather than coal of the carboniferous measures. The proportion of sulphur and ash is high, and altogether the coal is of little commercial value. Galleries have been driven for a short distance in these seams where the mines intersect

\* Abstract from Transactions of Mining Institute of Scotland.

them, and there are indications of improvement in thickness and quality toward the dip. No. 2 mine at Alcanada intersects No. 2 seam, into which a dook or dip drift has been driven for a distance of about 90 ft. Another adit mine is being driven at a lower level to intersect the three coal seams and clear the dook of water. In section, inclination and quality these seams are similar to those at Batalha. The small output of the Batalha mines was, within the past year, sold at 1,000 reis per cubic meter when the rate of exchange was 5,660 reis per £1.

The coal was riddled at the entrance to the mine and the dross carried in baskets on the heads of women to a hand-power washing machine worked by a woman. Women were paid from 5d. to 6d. per day. The water was directed by means of a dam and mill-race, part of the latter being steep. At this point, a woman shovelled the small coal into the current, which carried it into the machine; the washed dross was discharged over the mesh into a basket, which, when full, was emptied into the heap. The dirt was similarly treated; a small shutter fixed at the top of the shoot prevented it from getting out—until discharged when almost filled up to the level of the washed dross.

Imported coal is taxed at the rate of 3s. 6d. per ton; whether for the purpose solely of revenue or to protect and promote native industry, it is difficult to say; but in spite of the protective policy of Portugal, the exploration and development of its mineral resources would materially add to its prosperity.

In the vicinity of Porto de Moz, six miles south of Batalha, may be seen a coal seam 3 ft. thick, with sandstone roof and hard fireclay pavement, dipping 25° to the northeast toward the Mountain Limestone range of hills, at the base of which the coal-seam is exposed. Underlying it are beds of laminated blue shale with ironstone balls, and limestone beds from 2 to 10 ft. thick.

#### RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

**AGENT OR ATTORNEY MAY LOCATE MINING CLAIM.**—An agent or attorney in fact, may locate a mining claim for his principal, and may do everything necessary to perfect such location, including the making of the affidavit required by the laws of Idaho.—*Duclap vs. Pattison* (42 Pacific Reporter, 504), Supreme Court of Idaho.

**WHAT CONSTITUTES A MINING LEASE.**—A contract reciting that the landowner assigns to the other party all minerals on the land for a term of years, "to farm," and that such other party shall have the right of way over the lands on condition that he pay the landowner a percentage of the profits made from mining the minerals, is a mining lease which is forfeited by failure on the part of the lessee to mine the minerals within a reasonable time.—*Shenandoah Land and Anthracite Coal Company vs. Hise* (23 S. E. Reporter, 303), Supreme Court of Appeals, Virginia.

**WHEN LIEN WILL NOT ATTACH TO MINING PROPERTY.**—Where, in an action to foreclose mechanic's liens, it conclusively appears from the record that credit was given to the party in possession of the property under an option to purchase, and not to the owner of the property, such liens will not, on the failure of the party in possession to whom credit was given to avail himself of his option, be enforceable against the owner of the mining property.—*Steel vs. Argentine Mining Company* (42 Pacific Reporter, 585), Supreme Court of Idaho.

**SUFFICIENT DESCRIPTION OF PREMISES FOR MINING LIEN.**—Where the same persons own two mining claims, only one of which has improvements on it, and it appears that the mines are known by the names of the parties working them, a notice of lien reciting that it is for work done within a designated period of three months on a mining claim, with improvements located in a particular mining district of a certain country, owned by the persons who had the work done, does not identify the claim with the improvements with sufficient certainty to create a lien upon such property. The description must be such as will enable one to identify the mining claim to the exclusion of any other premises. An incorrect description in a notice renders such notice invalid.—*Fernandez vs. Bursleson* (42 Pacific Reporter, 566), Supreme Court of California.

**RISK OF EMPLOYMENT IN MINING.**—Where the foreman of a mine, which was owned by a corporation having large interests in various places under the general charge of a superintendent, had power to hire and discharge the men, direct their work and generally to control all the ordinary operations of the mine, and upon complaint of another he had promised to remove a dangerous obstruction in the tunnel, and had afterward caused it to be removed, the Court held that it was within the apparent scope of the foreman's authority to promise to make the safety, and that the complainant did not, by continuing in the company's employment in reliance on such promise, assume the risks arising from the dangerous condition of the obstruction. Also, that the rule that an employer is not bound to replace an appliance, such as is in common use, because it is possible to get a better one, did not apply to relieve the mining company from the duty of protecting the exposed coupling of a shaft, as promised in this case.—*Homestake Mining Company vs. Fullerton* (69 Federal Reporter, 923), United States Circuit Court, District of South Dakota.

**Electrolytic Separation of Metals.**—The persistence with which E. T. Smith and D. L. Wallace have been following up the subject of the electrolytic separation of metals during the past few years is praiseworthy to the highest degree, for it is by no means a particularly fascinating one to the average man, and the results when attained do not appeal to a very wide circle, though it is probable that they will yet have an important bearing on the gold industry. They have succeeded, says the *Electrical Review* (London), in separating completely from other metals, by using cold solutions of the double cyanides, cadmium, mercury, gold and silver; but from 12 to 14 hours was always required for the purpose. Smith working with Spencer have accelerated the deposition of both mercury

and silver by heating the electrolyte to from 65° to 70° C. Following up this hint, Smith and Wallace now show that by working at a temperature of 65° C. mercury can be separated quantitatively from cadmium, zinc, nickel and cobalt in cyanide solution, containing a little free potassium cyanide by using a current density of from 0.02 to 0.08 (preferably 0.06) ampere per 100 sq. cm. of electrode surface. Similarly, and at the same temperatures, gold can be separated from cobalt, arsenic, zinc and nickel, by a current of 0.1 ampere, or from copper by one of 0.07 ampere per 100 sq. cm. of electrode surface. Silver can be separated from zinc, nickel and cobalt, as well as from copper and cadmium, by a current of 0.04 ampere per 100 sq. cm. The precipitates are stated by Smith and Wallace to have been pure, and the time required ranged from 3 to 3½ hours. There yet remains the problem of determining the conditions for the separation of silver from gold and of mercury from gold and silver in cyanide solutions.

**Electric Haulage and Propulsion.**—Electric haulage experiments are being carried on at a selected section of the Burgundy Canal by the Societe de Traction Electrique des Bateaux sur les Voies Navigables. Two modes of propulsion are being tested. Either an electrically-propelled iron boat is fixed to the sterns of the barges or they are hauled by a motor secured to a frame suspended from an overhead wire. The canal is 10 m. wide at the bottom and 1.8 m. deep, the draft of the barge, loaded to 186 tons (1,000-kg. ton), being about 1.5 m. The current was supplied to the line at a pressure of 300 to 350 volts from a turbine driven dynamo, the water being used as described in a recent issue, that necessary to make good the losses by infiltration. Using the "bachot propulseur" and a barge 36 m. long with a square stern, the following results were obtained, the current varying from 12 to 14 amperes:

Load (tons).	Speed (kilometer per hour).
100	3.0-0
150	2.7-2.8
180	2.5-2.6
230	2.3-2.4

With a more suitable type of barge, with a load of 70 tons, a speed of 4 km. was attained. The "electric horse" hauled two 200-ton barges at a speed of 2 km. an hour, the current varying from 10 to 12 amperes.

#### 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 JANUARY 21st, 1896.

- 553,534. **RECIPROCATING DRILL** Adolph E. W. Meissner, Charlottenburg, Germany. Assignor to the Siemens & Halske Electric Company of America, Chicago, Ill. Filed August 15th, 1895. Patented in Belgium March 15th, 1894, No. 102,701; in Italy March 21st, 1894, No. 35,821; in France May 4th, 1894, No. 236,250; in Germany May 29th, 1894, No. 76,630; in South African Republic, June 19th, 1894, No. 654; in England November 17th, 1894, No. 650; in Norway November 30th, 1894, No. 3,592, and in Sweden January 24th, 1895, No. 3,785. Combination with the casing enclosing the plunger and provided with bearings at the ends, of a plunger reciprocating in the bearings, a collar mounted upon the plunger, a pair of plates fitting loosely over the plunger and rigidly connected together, a pair of coiled springs, one situated between the collar and each of the plates, a crank shaft mounted upon the casing extending perpendicularly thereto, and carrying a crank pin engaging a slot in one of the plates, a flywheel mounted upon the outer end of the crank shaft, and a flexible shaft connected with a motor mounted independently of the casing, the flexible shaft being geared with the crank shaft to rotate the same.
- 553,560. **ORE CONCENTRATOR APPARATUS** John S. Loder, Ouray, Colo., Assignor of three-fourths to Alexander Cuninghame, Birmingham, Ala. Filed April 29th, 1893. Combination with the belt and a water conduit provided with jet orifices, of a pulp receptacle, located above the belt and in advance of the conduit provided at its bottom with a series of hollow brushes through which the pulp is discharged.
- 553,634. **AMALGAMATOR** Samuel A. West, San Francisco, Cal., Assignor of one-half to William H. H. Hart, same place. Filed September 20th, 1895. A box, a series of oppositely inclined supports or shelves, each side terminating short of the opposite to leave spaces from one shelf to the other successively, amalgamating plates extending over the supports or shelves, and traversing the spaces, having the portion extended over the spaces perforated, a hopper at one end of the box and a discharge at the opposite end.
- 553,702. **CRUCIBLE** Charles Capper, Wilkensburg, Pa., Assignor of one-half to W. D. Corcoran, Pittsburg, Pa. Filed March 25th, 1895. Combination with an ordinary crucible, a segment or section cut from the body of an old and worn-out crucible, resting upon the afore-said crucible, a short distance below the upper edge of the latter, and an internal ring suitably formed so as to allow it to rest upon the upper edge of the first named crucible, thereby forming an extension to the same which may be filled with fragments of the scrap to be melted, the peculiar construction of the internal ring preventing leakage of the molten metal and causing the metal as it melts to fall by gravity into the chamber below, thereby greatly augmenting its capacity.
- 553,775. **METHOD AND APPARATUS FOR PLACER MINING** Edward D. Bronson, Denver, Colo. Filed April 11th, 1895. Combination with a line of sluices raised above the level of the ground to such a height as to insure the certain delivery of the material thereon, and to provide ample dump for the tailings therefrom on the surface below the line of sluices, of a force-pump and a flexible hose connected thereto for disintegrating and drenching the material to be treated and a centrifugal pump and flexible connection adapted to convey the disintegrated and drenched material to the line of sluices.
- 553,778. **HOISTING AND CONVEYING MACHINE** Alfred H. DeCamp, Trenton Junction, N. J.; Estelle Austin De Camp and Clarence A. De Camp, executors of said Alfred H. De Camp, deceased, Assignors to the Trenton Iron Company, Trenton, N. J. Filed November 13th, 1894. A way, a fall-rope with a support, suspended from a point above the way, the fall-rope support consisting of a frame composed of two members straddling the way and extended below the same on each side thereof and adapted to be deflected outwardly from each other, and means for sustaining the fall-rope support, in combination with a carriage mounted on the way and passing in its movements between and deflecting outwardly the members of the fall-rope support, and means for closing together the members of the fall-rope support and retaining them normally in a closed position.
- 553,817. **PLACER MACHINE** Henry A. Walker, Denver, Colo. Filed October 26th, 1894. Combination with the stationary framework, of a sluice attached thereto and formed with an opening in the bottom, the grate-bars placed in the opening, a chute below the grate-bar comprising a false bottom and side pieces connecting the bottom with the sluice; the chute terminating in a mouth comprising a depending flange attached to the false bottom and the depending plate attached to the sluice, together with suitable end pieces; the adjustable valve comprising a plate located in the mouth and hinged to the depending flange between the latter and the plate a crank-arm for adjusting the valve, a ratchet-arm for supporting the crank-arm in any desired position of adjustment, and the concentrating-box located below the sluice and adapted to receive the discharge therefrom.

## PERSONAL.

Mr. E. L. WOOD, assistant superintendent of the Homestead Steel Works, has returned from a three months' visit to Europe.

The well-known firm of HUNT & ROBERTSON, assayers and chemists, was dissolved on January 21st, and the business will be continued as heretofore at No. 77 Pine street, New York City, by Mr. FRED. F. HUNT.

Mr. CLARENCE S. BEMENT, of Bement, Miles & Company, Philadelphia, Pa., has just been awarded the silver medal, "Bene Merenti," of the Royal Academy of Sciences, at Munich, Germany, for distinguished services in advancing the science of mineralogy.

Mr. HENRY WEHRUM, who was for years chief engineer of the Scranton Steel Company, and later, when the present management assumed control of the Lackawanna Steel & Iron Company, was appointed chief engineer and general superintendent, has now been made general manager. He succeeds C. McKinney, who has resigned on account of ill health.

President Cleveland has appointed the following as members of the ASSAY COMMISSION to test and examine the weight and fineness of the coins reserved at the several mints during the year 1895: Senator O. H. Platt, Connecticut; Representative Charles W. Stone, Pennsylvania; Prof. Thomas M. Drown, Lehigh University; Prof. C. P. Jackson, Harvard College; Henry Burnett, Paducah, Ky.; Edward O. Leech, ex-Superintendent of the Mint; Prof. J. W. Mallett, University of Virginia; Marcus Benjamin, New York; Eugene B. Braden, Helena, Mont.; Andrew Stevenson, Columbus, O.; Cabell Whitehead, Washington; Charles H. Baner, Philadelphia; Douglas H. Thomas, Baltimore.

## OBITUARY.

COLE H. WATTS, a civil engineer of merit, died in Chicago, Ill., on February 2d, aged 50 years.

SEVERINO BELLO Y LONGA, a well known Spanish mining engineer, died on January 9th in Madrid, aged 52 years. He was born in Tuy, province of Pontevedra, and joined the Corps of Mining Engineers in 1870, having previously spent some time at the quicksilver mines of Almaden. He later was connected with the mining department of the Ministry of the Interior.

Late advices from South Africa report the death of WILLIAM HOLLAND FURLONGE, mining engineer, at Madagascar. He was a native of Kerry, Ireland, and was educated at Victoria College, Jersey, England. He went to Canada in 1872, and was Provincial Land Surveyor, practicing, in addition, mining engineering work. He was an occasional contributor to the *Engineering and Mining Journal*. In 1888 he went to South Africa, and last fall made a professional trip to Madagascar where, it is believed, he succumbed to malarial fever. He was about 45 years of age.

WILLIAM PAUL THOMPSON died in New York City, on February 3d, aged 59 years. He was born in Wheeling, W. Va., and during the war commanded a regiment in the Confederate army. After the war he resumed the practice of the law for a few months in Doddridge County, W. Va., but in 1866 he went to Parkersburg, and entered the petroleum business with his brother-in-law, afterward Senator J. N. Camden. When the production of West Virginia oil began declining, the firm built refineries for manufacturing lubricating and refined oils. In 1875 the firm entered into relations with the Standard Oil Company, and the Camden Consolidated Oil Company was formed, with Senator Camden as president and Colonel Thompson as vice-president. In 1881 Colonel Thompson moved to Cleveland as one of the executive officers of the Standard Oil Company. A year later he was elected secretary of the Standard, and in 1884 he succeeded Col. Oliver H. Payne as vice-president. Three years later he came to New York City, and when the Standard Oil Trust was formed by a union of separate companies he became Chairman of the Domestic Committee, having charge of the internal affairs of the trust. The year 1890 saw the consolidation of all the leading factories of white and red lead which formed the National Lead Company. The affairs of the combination were not in a satisfactory condition, and Colonel Thompson was invited to undertake the task of reorganizing the new corporation. This duty involved protracted labor, great tact, and a talent for organization. Colonel Thompson's administration of the affairs of the company was successful. He was a director in several banks and was interested in a number of railroad and commercial enterprises.

## INDUSTRIAL NOTES.

Samuel F. Vinnedge has been appointed receiver for the Montpelier (Ind.) Sheet and Tin-plate Company. The works have been shut down for the past month.

The Sterling Steel Company is making a number of improvements to its plant at Demmler, Pa., among which are two new annealing furnaces, a gas producer and a powerful dynamo.

The New Castle (Pa.) Tube Company is doubling its rolling mill, putting in two more sets of rolls and two heating furnaces. The company expects to erect another warehouse in the spring.

The Dillon-Griswold Wire Company, of Sterling, Ill., will begin operations in its new plant in a short time. The wire drawing room will have 70 blocks, and the nail factory will contain 30 wire nail machines.

The Wellston Steel and Iron Company's furnace at Wellston, Ohio, ran 310 days in 1895 and made 17,500 tons of iron, 95% of which was Nos. 1 and 2 foundry iron. The company is now making 80 tons a day, using lake and native ores.

The Hollidaysburg, Pa., Iron and Nail Works resumed operations on February 3d in all departments, after a week's shutdown, due to the boiler explosion. The capacity of the plant has been increased and a large force of men is employed.

At the annual meeting of the Syracuse (N. Y.) Tube Company, the following officers were elected: President, John Don, of Troy; vice-president, Thos. Colwell, of Troy; treasurer and general manager, Geo. Timmins; secretary, J. M. Colwell.

The stockholders of the Wheeling, W. Va., Iron and Steel Company have elected directors as follows: C. R. Hubbard, Thomas O'Brien, A. W. Campbell, W. A. Issett, George K. Wheat, Alonzo Loring, A. J. Clarke, William Stifel and H. H. Hornbrook.

G. P. Nichols & Bro., Chicago, Ill., will equip the Michigan Central Railroad Company's swing bridge at Bay City, Mich., with electric operating machinery. The contract includes a compressed air plant for operating the end lifting mechanism.

The National Tube Works Company, of McKeesport, Pa., is conducting some interesting tests with electricity in its plant. The machinery at the No. 8 welding furnace in the mill was connected with a dynamo recently and run by electricity for the first time.

The 7-in., 9-in., large bar mill, both old and new puddle mills, and shafting works of the Mahoning Valley Iron Company, at Youngstown, O., are now in operation. The blast furnace at this plant is being repaired and it is expected that it will be blown in very shortly.

The Brush Electrical Engineering Company, Limited, of Queensland, has recently installed an electric lighting plant in the Brilliant Gold Mine in Queensland. The plant comprises a two-pole "Brush-Vienna" dynamo, capable of running about 100 16-C. P. lamps.

The Folsabee Bros. Company, of Pittsburgh, Pa., has purchased additional ground adjoining its Allegheny tinning house, and will enlarge the plant. The company has already ordered new machinery for this purpose. With this increased capacity it will be able to fill all orders promptly.

The Basic City Iron Works of Staunton, Va., has secured a loan of \$100,000 through the Central Trust Company of New Jersey. This plant, it is said, will in a short time resume operations by the required capital being secured by his mortgage, in which the New Jersey Trust company is trustee.

The National Foundry and Pipe Works, Limited, of Scottdale, Pa., is running its old plant full, and is pushing work on the new one. The firm is now testing the 30-ton electric cranes in the 48-in. pit, and if they operate successfully it will at once place orders for smaller cranes for use at second new pit.

The Berlin Iron Bridge Company, of East Berlin, Conn., has just completed for the Newport News Foundry Company at Hampton, Va., a large trolley, 40 ft. wide and 160 ft. long, the central portion being controlled by a traveling crane. This is one of the best and most modern foundries of the Southern States.

The Lassig Bridge and Iron Company, Chicago, has lately taken contracts for furnishing 226 coal spouts, plate girder and lattice span bridges, amounting to about 400 tons for the Duluth & Iron Range Railroad, and four 150-ft. spans for the Des Moines river bridge for the Chicago, Rock Island & Pacific railroad.

Max K. Moorhead has filed a deed for \$300,000 of property in the recorder's office to satisfy a claim against the Moorhead-McCleane Company, of Pittsburgh. At the failure of the corporation several years ago the debts amounted to about \$600,000, and of this amount Mr. Moorhead had given his personal note for \$300,000.

At the recent annual meeting of the directors of the Riverside Iron Works, Wheeling, W. Va., a resolution was presented to increase the capital stock by 33% out of the accumulated surplus. This was adopted and a stock dividend of that amount was declared. In addition to this a cash dividend of 4% was declared.

The Ohio Steel Company, of Youngstown, O., has decided to increase its capacity in its converting department, and is having plans prepared for the erection of two cupolas similar to those now in use, which it is expected will increase the present output 1,200 tons fully 50%. The new cupolas will be ready for operation in May.

Plans have been prepared for the reorganization of the Aetna Foundry and Machine Company, of

Warren, O. Those interested are Lloyd Booth, H. M. Garlick and Charles Booth, of Youngstown; C. W. Bray, of Lisbon; J. W. Russell, of Warren, and J. Strouche, of Anderson, Ind. The capacity of the plant will be increased.

The Pacific Sheet Metal Works have filed articles of incorporation at Sacramento, Cal. Principal place of business, San Francisco. Capital stock, \$1,500,000; subscribed, \$700,000. William P. Johnson, Irvine Ayers and Francis Cutting, of Oakland, John Lee, of San Mateo, C. H. Watt, A. D. Cutler and Sidney M. Smith, of San Francisco, directors.

The Lochiel Furnace Company, of Harrisburg, held a meeting recently, at which the following directors were elected: Henry McCormick, Jas. M. Cameron, John Q. Denny, Spencer C. Gilbert, W. L. Small, E. R. Coleman, G. Dawson Coleman, Victor Gurrillion and Geo. B. McCreery. The board elected Henry McCormick president and H. B. McCormick, secretary.

The Standard Malleable Iron Company has been organized at Muskegon, Mich., by the election of the following officers: Geo. H. Kingsley, president; E. L. Howe, vice-president and general manager; P. J. Martin, treasurer; and M. O. Senseny, secretary. A plant in that city which has been idle for some time, will be thoroughly equipped and put in operation March 1st.

Owing to the stagnation in the iron trade, the Cambria Iron Company has decided to bank its furnace at Hollidaysburg, Pa., and its two furnaces at Johnstown. The suspension of work at the Hollidaysburg furnace will affect the mountain coal operators, as this furnace consumes 150 tons of coal a day, and gives employment to 250 men. The stoppage of operations will last one month.

Secretary Rankine, of the Niagara Falls Power Company, has announced that his company has made a contract with Walton Ferguson, of New York City, under which Mr. Ferguson will erect a factory for the manufacture of chlorate of potash on the lands of the power company and use from 500 to 3,500 H. P. The site selected is to the east of the new calcic carbide plant and covers an acre of ground to start with. The buildings will be put up at once.

The Avonmore Glass Company will operate the new factory of the Keystone Glass Company, at Avonmore, Pa., the purchase having been made a few days ago. In addition to operating the factory the company will erect a new plant to manufacture thin plate glass, mirrors and other glass products. About 200 men will be employed in both factories. The officers are: James A. Pearce, president; Chas. A. Hill, secretary and treasurer, and M. G. Collins, general sales agent.

That the product of the Westinghouse Electric and Manufacturing Company is of world-wide demand has again been demonstrated recently by the company receiving orders to equip an electric railway in the Isle of Man, another order for electric railway apparatus for the city of Coventry, England, and a third order for electric motors and railway generators for Capetown, South Africa. The company is also about to ship an order for electric railway apparatus to Bangkok, Siam.

The well known Rand Drill Company, which has been so long established in business at 21 Park Place, has removed to more convenient offices in the American Surety Building, 100 Broadway, corner of Pine street. The name of this company has become a perfect household word in connection with rock drills and air compressors, and we wish it as successful a career in its new quarters as it has had in the old ones. The company has continuously carried an advertisement in the *Engineering and Mining Journal* for more than 20 years.

The Crescent Sheet & Tin Plate Company, at its annual meeting in Cleveland, O., last week, decided to begin at once the operation of its tinning department. Heretofore it has confined itself to black plates. The following directors were elected: H. P. McIntosh, Arthur B. Foster, Francis Widlar, N. C. Brewer, R. H. Boggis, W. J. Morgan, E. W. Moore, James Paton and J. A. Mathews. The officers for the ensuing year are: H. P. McIntosh, president; Arthur B. Foster, vice-president; J. A. Mathews, secretary and treasurer, and James Paton, superintendent.

The launching of the new Plant steamer *La Grande Duchesse* and the United States gunboat *Helena* took place on January 30th, at the Newport News Ship Building and Dry Dock Company, Newport News, Va. The Plant steamer has a complete outfit of Blake pumps, including independent air pumps for the main condensers. These air pumps are of the Blake vertical twin system, the same as are used on the Cramp cruisers and other vessels. The gunboat *Helena* is also equipped with a complete outfit of Blake pumps of the vertical type.

Jas. S. Brownell, Western agent of the Frue Vanning Machine Company, at San Francisco, reports the following sales: Esperanza Mill, Mokelumne Hill, Cal., six 6-ft. plain belt Frue Vanners; Jackson & Lakeview Mining Company, Lundy, Cal., one 4-ft. patent lip flange belt Frue Vanner; Hector Mill, Sutter Creek, Cal., 16 4-ft. patent lip flange belt Frue Vanners; C. C. May, Davenport, Wash., four 4-ft. patent lip flange belt Frue Vanners; J. H. Huffer, Jacksonville, Ore., one 4-ft. patent lip flange

belt Frue Vanner; W. Y. O. D. Mine, Grass Valley, four 4-ft. patent lip flange belt Frue Vanners.

The Berlin Iron Bridge Company, of East Berlin, Conn., has just completed a very successful year. The shipments have been the largest in the history of the company, and are represented by over \$1,500,000 worth of business. At the annual meeting of the stockholders, which was held at the office of the company on January 30th, the following directors were elected: Charles M. Jarvis, Burr K. Field, George H. Sage, H. H. Peck, of Waterbury; S. H. Wilcox, of Brooklyn, N. Y.; J. W. Burr and F. L. Wilcox. At the meeting of the directors the following officers were elected: President and chief engineer, Charles M. Jarvis; vice-president, B. K. Field; secretary, George H. Sage; treasurer, F. L. Wilcox; manager of highway bridge department, D. E. Bradley; assistant to the president, E. W. Stearns.

The Cambria Iron Company, in its annual report for the year ending October 31st last, shows \$641,136 profits from the manufacturing department, with other income, which brings the total income up to \$719,331. It paid \$20,000 dividends (4%), \$100,000 for guarantee on new stock issue and \$293,185 for betterments, improvements, etc., leaving a surplus of \$124,146, which was credited to profit and loss, making that account \$4,618,190, out of which a stock dividend (12%) was made of \$890,000, leaving balance to credit of profit and loss October 31st, \$3,728,190. The real estate and improvement account of the company stood on October 31st at \$7,628,520, having been increased about \$568,000 during the year. The aggregate capital stock is \$7,974,550. The business of the company increased nearly 23% in value during the year, the total amounting to 270,513 tons, valued at \$7,001,045.

At the annual meeting of the stockholders of the Niles Tool Works Company, of Hamilton, O., the following directors were elected: Matthew Addy, Frank J. Jones, Thos. T. Goff, James D. Parker, Wm. S. McKinney, Alex. Gordon, Robert C. McKinney, George T. Reiss and James K. Cullen. All these served last year except Wm. S. McKinney, a Pittsburg man, who was elected in place of W. P. Anderson, of Cincinnati. The board organized by electing Alexander Gordon president; James D. Parker, vice-president; James K. Cullen, secretary, and Robert C. McKinney, treasurer and general manager. The company declared the usual 3% dividend on the common stock for the six months just ended. The preferred dividend is paid regularly without formal action of the stockholders.

#### TRADE CATALOGUES.

The Standard water-tube safety boiler, built by the Link Belt Machinery Company, of Chicago, Ill., is well described in a new catalogue sent out by the Standard Boiler Company, 1120 Marquette Building, Chicago. The adoption of this type of boiler is becoming much more general, and its advantages better recognized, and the term "safety" may be truly applied to it. The catalogue is well illustrated, and gives a good idea of the large scale upon which these boilers have been supplied by the company.

An artistic catalogue illustrating the special line of machine tools for working iron and steel plates, bars and structural shapes built by the Hilles & Jones Company, of Wilmington, Del., has just been issued. The illustrations are on such a large scale and so remarkably well executed that they require no explanation, and for this reason they are accompanied by no descriptive matter. It is sufficient to say that these works turn out complete equipment for boiler, tank and pipe shops, car, locomotive and iron shipbuilding works, rolling mills, bridge and structural iron works, etc.

We are in receipt of a very complete catalogue just issued by The Nelsonville Foundry and Machine Company of Nelsonville, O. This firm builds haulage, hoisting and stationary engines, also tail and endless rope haulage plants besides many other specialties in the field of steam and electric power machinery. A perusal of the catalogue is most instructive and it is well worth the while of any engineer to go through it carefully. The power transmission machinery and labor-saving appliances for all industries, improved appliances for elevators, conveyors, etc., will all attract attention and what makes the catalogue more valuable, is its extreme and accurate detail and clear illustrations.

Under the title of "The Norwalk," a new catalogue has been issued by the Norwalk Iron Works Company, of South Norwalk, Conn., describing and illustrating their latest developments of air and gas compressors, which are recognized by high authorities as filling every requirement for compressing air for power and for liquifying carbonic acid and other gases and for pumping natural gas. These compressors are built in various styles, being especially designed for driving coal cutters, rock drills, pumps, engines, pneumatic locomotives and other machinery. The catalogue, as is usual with all the publications of this company, is complete and distinct in its descriptions and clear in its illustrations.

There has been no finer illustration of rock work and general excavation than that performed in carrying out the works of the Chicago drainage canal, and in connection with this the Ingersoll-Sergeant Drill Company has issued a very interesting pamphlet giving an account of the work and

the methods by which the cut through the rock divisions of the canal was carried out. To show the large part which the machinery supplied by the above-named company contributed to the accomplishment of the work we may mention that the latest summary of the number of machines furnished to the contractors and in use on the canal was 34 Ingersoll-Sergeant channelers, 129 Ingersoll-Sergeant rock drills, seven Ingersoll-Sergeant air compressors, making in all 170 machines of the Ingersoll-Sergeant type. As a handbook with the Chicago drainage canal as an object lesson, this pamphlet with the title "Compressed Air," should be most instructive to engineer and contractor alike contemplating work on the Nicaragua Canal or any such enterprise.

#### 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.

##### ARIZONA.

###### PIMA COUNTY.

TUCSON SMELTING COMPANY.—Barrett & Filis have leased their copper mines in the Dragoon Mountains to the Tucson Smelting Company of Tucson. Work will begin at once. The main shaft is down 80 ft., and considerable drifting has been done.

(From an Occasional Correspondent.)

AUSTERLITZ.—These mines are under bond to California parties. The mill is not running.

BEAR VALLEY.—Rich ores of gold and silver were discovered near Bear Valley, 10 miles east of Oro Blanco, a few weeks ago, and are now being prospected.

GOLDEN EAGLE.—The testing mill (one stamp) has been moved to the new dam, which insures water supply for a large mill.

MONARCH.—The owners are running a steam arrastra, on porphyry ore, with good results.

MONTANA MINING COMPANY.—This company is putting in a cyanide plant for the tailings, which carry traces of silver and considerable gold, which the concentrators (revolving puddles) do not catch.

OLD ORO BLANCO, GOLD BUG, AND GRUB STAKE.—These, like the Tres Amigos, Sorrel Top, and Oro Fino, are porphyry veins, siliceous and porphyritic material in fissures in diorite, carrying free gold in paying quantity.

ORO AND JULIA.—The mill is completed, and started up last week.

ORO FINO.—The shaft is 60 ft. deep and progressing rapidly. The vein shows good free gold, and has increased in richness with depth.

SORREL TOP.—The shaft is now down about 150 ft., and is being sunk 50 ft. deeper. The width of the vein is still unknown.

TRES AMIGOS.—The mill, a Wiswell, is running, with satisfactory results.

YELLOW JACKET.—Operations will shortly be resumed at this mine and mill. A new working shaft seems to be the principal necessity.

##### CALIFORNIA.

###### BOULDER COUNTY.

(From Our Special Correspondent.)

GOLD HILL.—A published statement of the mineral production of Gold Hill, Sunshine, Salina and Gold Run, four prominent producing sections of Boulder County, since their discovery in 1859 estimates the aggregate production up to date as valued at \$5,025,500. Of this amount Gold Run furnished \$225,000 between 1859 and 1868.

###### BUTTE COUNTY.

(From Our Special Correspondent.)

GOLDEN CHANNEL.—This mine is on Butte Creek, northwest of Powelton, and will be opened up as soon as the weather permits. The channel was struck some years ago and a tunnel run 375 ft. This tunnel will be extended until the gravel is reached.

###### CALAVERAS COUNTY.

(From Our Special Correspondent.)

COPENHAGEN.—Work on this gravel claim in Chile Gulch is progressing steadily. The upper tunnel is 110 and the lower one 170 ft. in length. A shaft is being sunk from the end of the 110-ft. tunnel.

EL ENCINO.—The drain tunnel 1,500 ft. long is now connected with the shaft, and a drift has been extended west striking the channel and exposing 6 ft. in depth of blue gravel, prospecting well in gold and carrying 5% sulphurets, which run from \$30 to \$80 per ton. The company has about 1,000 ft. on the channel. Drifts will be run across to determine the

proper place to sink a working shaft. There are 10 men now employed.

FELLOWCRAFT MINING COMPANY.—This company has been incorporated with a capital of \$100,000. J. W. Provard and J. S. Myer, of Oakland, George W. Lewis, of Alameda, Cal., and E. H. Cottrell, of New York, directors.

##### EL DORADO COUNTY.

(From Our Special Correspondent.)

LADY EMMA.—This mine is five miles from Placerville. The shaft is down 275 ft. on a 6-ft. vein of high grade ore. A 10-stamp mill is in course of erection.

##### MARIPOSA COUNTY.

(From Our Special Correspondent.)

RIVERSIDE.—On this mine, located on the north fork of the Merced River, a shaft has been sunk 50 ft. and a tunnel run on an 18-in. vein of pay ore, to a depth of 100 ft.

##### MONO COUNTY.

BULWER MINING COMPANY.—The superintendent's letter for last week says: During the week 9 tons of ore were extracted from the stopes on the Bulwer tunnel level and the 200-ft. level; estimated value per ton, \$20. The stopes above the main south drift Bulwer tunnel level continue to yield a small quantity of gold. The ore seams above the 200-ft. level continue to yield the same amount of ore. South drift from upraise above main drift of 100-ft. level was extended 13 ft.; face in quartz and porphyry.

BODIE CONSOLIDATED MINING COMPANY.—The official letter from the superintendent for the week ended January 25th says: The north drift 200 ft. level, was extended 8 ft. Have 2 ft. of low-grade quartz in the face. South drift was extended 10 ft., and the quartz in the face is 10 in. wide. East crosscut from Gildea vein, 300-ft. level, was extended 18 ft. The face is in porphyry.

##### NEVADA COUNTY.

(From Our Special Correspondent.)

PENNSYLVANIA.—At this mine, 1½ miles from Grass Valley, a crosscut is now being run to strike the pay chute at the 500-ft. level. The ledge now being worked is about 4 ft. wide. The ore is low grade.

##### PLACER COUNTY.

(From Our Special Correspondent.)

ELLEN DIP CONSOLIDATED.—This mine in the Colfax district has two tunnels tapping the ledge. At 200 ft. from the surface the vein is about 18 in. wide, the rock assaying from \$6 to \$7 per ton.

LA PORTE CONSOLIDATED GOLD MINING COMPANY.—This company has been incorporated under the laws of West Virginia with a paid up capital of \$4,000,000. Simcoe Chapman, of Chicago, is president. The stockholders are principally Minnesota and Illinois men. The company has acquired the property of the Old La Porte Mine and Dutch Company (better known as the Dutch Claim), the Garr & Orr Claim and the Cowan & Gowell claim, all located at La Porte. These claims have produced a large amount of gold in past years. Repairs have just been completed on the 40 miles of ditches, and an impounding dam has been built, also a dam to store water to supply the ditches the year round. A permit has been given by the Debris Commission to impound their tailings, and they are now using 5,000 in. of water with a 400 ft. pressure to operate the three giants now on the ground.

##### RIVERSIDE COUNTY.

(From Our Special Correspondent.)

LITTLE MAGGIE.—This mine is located about four miles west of Ferris. Shafts have been sunk from 50 to 175 ft. in depth and several hundred feet of drifting has been done. The vein is small, but the ore is rich, running from \$40 to \$100 per ton. A one-horse arrastra has paid all the working expenses of the mine. Arrangements are being made to put in improved machinery and to work the mine on a large scale.

##### SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

MORMON.—At this mine, located at the Lava Beds, 40 men are at work and three 18-mule teams are hauling to Calico. The ledge, which is 50 ft. wide, carries a good percentage of free gold. Arrangements are being made to put in a large Bryant mill.

##### SAN DIEGO COUNTY.

(From Our Special Correspondent.)

CHAPMAN & BROWN COMPANY.—This company has purchased 800 acres of mineral land near Escudido, and has 150 men doing development work. There is a large amount of low-grade refractory ore on the property, but it increases in richness with depth. A 200-stamp mill is to be erected at once.

OWENS.—This property comprises the Old Owens, New Owens and Jeannette claims, located near the town of Julian. Arrangements have been completed to re-open them on a large scale.

RANCHITA.—This mine, near Banner, is producing some fine ore. The ledge is 3 ft. wide and drifts from the 80 ft. level show it to hold the same width. The last mill run averaged \$55 per ton.

##### SHASTA COUNTY.

(From Our Special Correspondent.)

OLD SPANISH MINING COMPANY.—This company was organized to work the old Spanish mine in the

Lower Springs district. The shaft is down 100 ft. on an 8-ft. vein, which will average \$10 per ton. A 14-in vein of sulphurets has been found in the ledge. These are sent to the Mountain mines at Keswick to be worked. Hoisting works will be erected and the shaft remodeled and sunk to a depth of 200 ft.

TULARE COUNTY.

(From Our Special Correspondent.)

**RATLESNAKE.**—This mine is located near Auckland. A tunnel has been run into the mountain 400 ft. to the ledge, and a shaft, 600 down 200 ft., is being sunk on the vein, which is 3½ ft. wide. There is a Huntington mill, a 14-H. P. engine and a Hendy feeder on the property.

COLORADO.

**OMAHA & GRANT SMELTING AND REFINING COMPANY.**—The annual meeting of this company was held in Denver on January 28th, and the following Board of Directors was elected: Guy C. Barton, E. W. Nash, J. H. Millard, J. E. Thatcher, James B. Grant, Edward Eddy and William H. James. The board elected Guy C. Barton, president; James B. Grant, vice-president, and E. W. Nash, secretary and treasurer. The company, as demonstrated by the reports of the officers for 1895, is in good condition and pays quarterly dividends upon its capital stock of \$2,500,000. The ore supply is steadily increasing. The Denver and Omaha plants are shipping in large quantities of material from the Cœur d'Alene and from Utah mines. The gain in business, comparing 1894 with 1895, is shown by the following table extracted from the secretary's report:

	1891.	1895.
Gold, oz.	138,755	255,650
Silver, oz.	12,371,938	12,013,434
Lead, lbs.	63,325,959	65,978,860
Copper, lbs.	980,600	514,000
Bluestone, lbs.	6,815,461	6,920,839

The value of the company's gold output in 1895 reached \$5,284,285, and of this \$4,185,665 was credited to the Denver plant, which is mainly supplied with gold ores from the Cripple Creek district.

CLEAR CREEK COUNTY.

**MIC-MAC GOLD MINING COMPANY.**—New machinery has recently been purchased by the company, and it is proposed to begin operations at once at the Headlight and Halifax claims situated near Georgetown. The main shaft at the Headlight claim is down 132 ft., from which there have been run two levels on both sides of the shaft, the first being at a depth of 75 ft. and the second 130 ft. It is reported that the shaft has been sunk in ore for over 60 ft. from the first level, and increases in quantity and value as depth is attained.

EAGLE COUNTY.

**BELDEN.**—At this mine, near Red Cliff, which recently passed into the hands of an Eastern syndicate, two new strikes were made last week, one in the first contact and the other in the second contact. The disclosure of ore in the first contact is by far the larger, and its trend is said to indicate stopping territory 500 ft. long in the direction of what was formerly known as the high-line drift, one of the richest producing sections of the upper level in the new carbonate channel. The strike is at a depth of 90 ft. from the surface, on an inclined plane, and is tributary to the cross cut through the lime rock at the 600-ft. level. The new body trends backward toward the surface and may reach that point, but the management thinks it is the continuation of the gigantic stope opened at the 400-ft. level. In 10 ft. of development so far done the ore, a lead sand carbonate, has opened from a small bunch in the lime, to a body 10 ft. thick and having both sides and the roof still in ore. A force of 20 men is working on ore in different parts of the mine in the lower or second contact, a body of ore 4 ft. thick has been cut by a drift, the ore trending into virgin ground of stopping extent 300 ft. square. This ore was originally found at a depth of 82 ft. in a shaft, which was sunk at the front door of the office, where its strength was not enough to warrant following, but calculating the trend and distance, the management started a drift round a lime roll, with the results named. The ore house of the mine is filled to its utmost capacity and shipments will be resumed and be continued hereafter.

**LITTLE NELLIE.**—This property, which lies a short distance from the Belden, is under lease by Jacob Harman, Moses Lease & Co. It is a lime property. The lessees are working six men. The lessees have pushed prospecting in the property and the Little Nellie is now on the shipping list. The ore is the heavy lead sand carbonates.

GILPIN COUNTY.

**ALVA ADAMS.**—A new hoister has been placed in position at the Alva Adams, as also a new boiler of 25 H. P. The property which is owned by the Sutton Mining & Milling Company, has been leased and bonded for two years by Messrs. Toensmeier and Mowbray, of Denver, who expect to commence operations soon. The shaft is down at present 270 ft., and they expect to sink another 100 ft. and then drift, while sinking work will be carried on in the drifts, where there are stopes showing up considerable bodies of ore.

**GOLD COIN MINING AND MILLING COMPANY.**—At a directors' meeting of this company held in Central City the following officers were elected: E. W. Williams, president and general manager; C. L. Harker, vice-president; E. W. Davis, secretary and treasurer.

**KENT COUNTY.**—At this claim in Nevada district they are hoisting between four and five cords of ore daily, which is at present being treated at the New York mill. Twenty men are working in the mine, and at present all work is being done on the ore body in the tenth level west. At a distance of 300 ft. in from the shaft they are stopping, and the mill dirt here averages from 3 to 4 oz. gold per cord, and the smelting ore is reported to give returns of \$225 per ton. In the same level, at a distance of 800 ft. in, they have started in to stope, being up a distance of 20 ft. The crevice is from 10 to 15 ft. wide, and the ore taken from this stope, which is free milling, averages from 2 to 3 oz. per cord.

**PITTSBURG AND MEEKER.**—These properties, owned by McFarlane & Company, are now being worked through the Pittsburg shaft by the Denver Mining, Milling and Leasing Company, and are patented claims. At a depth of 110 ft. they are cross-cutting to connect with the Meeker shaft and will then commence work on the Meeker in the bottom of the shaft, there being a good supply of ore. Their intention is to sink the Meeker shaft an additional 100 ft. and re-crosscut to reach the 240 drift in the Pittsburg property. In the 110 level, besides cross-cutting they are also stopping, and the same work is being carried on in the 240 level. Samples of ore assay well in gold, it being smelting ore. Messrs. Johns & Martin are sub-lessees, working in another shaft sunk on the Pittsburg vein.

**STAR OF THE WEST.**—This group, situated in Lake district, comprises four lodes called the Star of the West, Gibson, Blind and Hard to Beat. The property is patented, calling for 7,000 linear ft., and is owned by J. C. Franks and C. Gibson, of Central City, and E. Beard, of Denver. This property was formerly a good producer, but has not been worked until recently since they were burned out in 1892. The owners have put in new ladders in the Star of the West shaft, and, in running a crosscut from this claim to the Hard to Beat, struck the vein a few days ago. The pay streak is from 6 to 12 in. wide. Some of the ore which was panned showed up well. The property is close to the Justice.

**ST. LOUIS JUSTICE GOLD MINING COMPANY.**—The new shaft house and machinery over the shaft of the East St. Louis Justice is nearly completed. A new 35 H. P. hoister and 50 H. P. boiler have been put in position. The property has two shafts down at present, and at a distance of 500 ft. east from the main shaft another shaft is being sunk, which is down at present 40 ft. This is a patented claim, and is owned by the St. Louis Justice Gold Mining Company with offices in St. Louis, Mo. The new shaft house is over the main shaft, being the center one, and is down 320 ft., being connected with the west shaft at a depth of 250 ft. A contract will soon be given to sink an additional 100 ft. Some rich mill ore has been taken from this shaft at a depth of 180 ft., which ran 15 oz. to the cord. The last shipment of iron, it is claimed, ran \$100 per ton. In the bottom of the shaft there is a 4-ft. crevice of iron. The company expects to employ 20 men and do considerable development work. The west shaft is down 340 ft., and the management will commence to drift east and west at this depth. The connection with the main shaft at a depth of 250 ft. is for air and for means of escape in case of necessity. The east shaft is being sunk for the same purposes.

**WASHINGTON.**—A party of Italians have leased this property, which adjoins the St. Louis Justice, and is owned by Eugene and Alonzo Dake. The shaft is down 172 ft. and drifting and stopping is carried on in the 165 and 175 levels. The pay streak is from 9 to 12 in. wide and the property has been making a good showing recently. The last shipment ran \$45 a ton at the smelters.

LAKE COUNTY.

(From Our Special Correspondent.)

**BIG SIX.**—Some good shipments are being made from the strike in the Nettie Morgan shaft and the ore body is opening up rapidly.

**BISON.**—The great iron ore bodies are being developed steadily and 100 tons of iron and 30 tons of carbonate are being shipped daily.

**CITIZENS' MINING AND LEASING COMPANY.**—Articles of incorporation were filed this week, capital stock \$15,000. Nine directors are to have charge of the affairs of this company, which is made up of the leading business men of the camp, who pledge themselves to a \$10 a share assessment each month if necessary. It has not yet been decided where work will be commenced.

**DENARGO MINING COMPANY.**—In the 470-ft. level of the main shaft of the Mike & Starr property some fine sulphide bodies have been opened up and shipments now run 400 tons a month of iron sulphide. The company is preparing to sink the shaft 200 ft. deeper.

**PROSPECT MOUNTAIN.**—Information from a reliable source reached here to-day to the effect that Denver capitalists have taken hold of a group of 18 claims located on Canterbury Hill. There are two shafts on the ground, and the new company intends to push work vigorously at once.

**TURBOT.**—With development work the grade of the mineral encountered is improving and the ore body is opening up nicely. Shipments have been increased to 40 tons daily.

**UNION LEASING AND MINING COMPANY.**—In addition to the large amount of development work and heavy shipments under way at the group of claims being operated by this company a new shaft is being sunk further north in Big Evans Gulch.

This is a large and important piece of work, for it means the encountering of great bodies of water and the final opening up of a new and undeveloped territory.

**WINAN.**—This is an important piece of work. A tunnel is being run along Printer Boy Hill to open up the rich ore chute of the Lillian. The contact matter shows mineralization, and the outlook is very encouraging.

**WOLFTONE.**—At a depth of 900 ft. the big ore chute is being developed at the fourth and fifth levels and 150 tons a day of a low grade sulphide are being shipped.

**YAK.**—The great Yak tunnel, already fully described in this journal, is one of the most important enterprises in the camp. It penetrates iron Hill and will soon reach out to Breese Hill. The most important work is now going on at the Mike shaft, as arrangements are being made to connect the Mike and Yak tunnels.

PITKIN COUNTY.

**PARK REGENT.**—Messrs. Copeland, Stockman, Finley & Rose and Cole have a good body of ore in a lease in the 11th level of the Park Regent. They have run into a body of ore about 20 ft., with no walls yet in sight. The ore, it is said, will average 48 oz. per ton, and they can ship 30 tons a day. This lease has been worked 14 months, and the ore body was recently found.

**SMUGGLER MOUNTAIN.**—There is promise of increased activity in mining operations on Smuggler Mountain for the future, says the *Aspen Times*. Quite a number of lessees have good bodies of ore, and shipments to the samplers through the Cowenhoven tunnel promise to be more than double what they have been for some months past.

GEORGIA.

PAULDING COUNTY.

**YORKVILLE GOLD MINING COMPANY.**—Concerning this company, mention of which was made in last week's *Journal*, an occasional correspondent writes: The directors of this company are: H. C. Wisner, president; A. L. Stephens, secretary and auditor; Wm. M. Courtis, treasurer and general manager; Jerome Croul, E. W. Megdaugh, W. J. Spicer, all of Detroit, Mich., and Alex. W. Smith, of Atlanta, Ga. The authorized capital is \$500,000. The property was put in at \$100,000, and \$300,000 has been raised in cash for the development and subsequent equipment. A steam hoist has been put on the mine, and three shafts are now being sunk to a depth of 115 ft. when a second level will be driven. The company owns 420 acres, 120 of which are mineral lands. The lode has been developed during the past two years in a small way, opening up some 800 ft. of drifts and crosscuts, and also doing some surface explorations, all of which give indications of great promise. Recent developments are very favorable, a late sample representing some 65 tons of ore taken out of the North winze, gave \$6.10 and the average of 4 ft. of ore from the South winze gave \$102 per ton. The distance between these points is about 500 ft. Rich ore is also found in small chutes, but the company will rely on the large body of low-grade ore that is being developed.

IDAHO.

SHOSHONE COUNTY.

**AMERICAN PLACER MINING COMPANY.**—The annual meeting was recently held in Wallace last week, and the following board of directors was elected: R. K. Neill, J. M. Porter, Horace G. King, George P. White, Harry F. Madgwick. The board then elected officers as follows: H. F. Madgwick, president; J. M. Porter, vice-president; H. G. King, secretary; Angus Sutherland, treasurer; H. E. Howes, manager.

ILLINOIS.

BUREAU COUNTY.

**SPRING VALLEY COAL COMPANY.**—The suit of State Mine Inspector Charles Duncan against S. M. Dalzell, general manager of this company, for criminal neglect in failing to follow several provisions of the State mining law, was begun in the County Court at Princeton on January 28th. The suit grew out of the case of Joseph Guest, who was recently killed by falling down a shaft. Witnesses for the prosecution testified that a stationary light was not provided at the top of the shaft the night Guest met his death. The defense will show that the top cager carried a light with him that night, and this brings his acts within the meaning of the law.

INDIANA.

MADISON COUNTY.

**NEW OIL FIELDS.**—The Oliver Jay Oil Company has leased 1,500 acres of land and will sink several test wells at once. The indications are said to be good for opening an extensive field in this county. The Standard Oil Company struck it rich, says the *Indianapolis Journal*, on the M. Shannon farm, in Section 16, Harrison township, Blackford County, by drilling in a well good for 170 barrels of oil a day. The Buffalo Oil Company and the Indiana Oil Company's No. 6, William Sharp farm, Nottingham township, Wells County, is good for 120 barrels a day. Standard Oil Company's well, No. 2, R. Pilkington farm, Van Buren township, Grant County, is good for 50 barrels. Same company's No. 4, on the L. Dunlisky farm, Nottingham township, Wells County, is good for 25 barrels. J. A. Grave's No. 9 well, P. B. Albertson farm, same township, is good for 25 barrels. The Manhattan Oil Company's No.

2, Sills farm, Chester township, is good for five barrels. H. C. Zeigler's No. 8, J. F. Dickason farm, Nottingham township, is good for 150 barrels. Mc Mahon, Deweese & Blackledge's No. 1, G. Phillips farm, Penn township, Jay County, is good for 25 barrels. Green Bros. No. 2, Miller farm, Bear Creek township, same county, is good for 95 barrels. Sheedy & Centlivre's No. 1, Maddox farm, Chester township, Wells County, is a 20-barrel well. Sharp & Hillman's No. 6, Rose farm, Nottingham township, is showing for a fair well.

**PEOPLE'S MUTUAL GAS COMPANY.**—Great interest is being manifested in the oil wells in Alexandria. One of the oldest gas wells belonging to the People's Mutual Gas Company is developing into an oil well. The oil flows, it is stated, at the rate of two to four barrels a day, and is increasing. The company has contracted for two new gas wells to supply the stockholders and patrons with gas, and when these are completed the oil question will be further investigated.

#### MICHIGAN. COPPER.

**ATLANTIC MINING COMPANY.**—This company produced 257 tons of mineral in January, against 200 tons in December, and against 252 tons in January, 1895.

**CALUMET & HECLA MINING COMPANY.**—This company has declared a dividend of \$5 a share, payable March 3d, to stock of record February 7th.

**CENTENNIAL MINING COMPANY.**—About 33,000 shares of this company have been deposited with the Old Colony Trust Company out of the 80,000 shares outstanding, and the legal campaign is now being actively prosecuted in New York and elsewhere. Of the \$130,000 outstanding bonds, \$30,000 was issued and closed out on a directors' loan of \$15,000, so that it is held that the company really owes only \$115,000. The stockholders never authorized the sale of the bonds at less than 90.

**WOLVERINE MINING COMPANY.**—This company's January output of mineral was 101 tons, the largest monthly product on record—against 83 tons in January, 1895.

**WOLVERINE MINING COMPANY.**—Wolverine shaft No. 4, in ground purchased a year ago, is making a satisfactory showing of copper. The Wolverine has been making 100 tons of mineral per month for the past three months, and the stamp mill, which is at the mine, is crowded. The company is figuring on leasing the old Allouez mill and running one stamp there, which can be done economically.

#### IRON.

**JACKSON IRON COMPANY.**—The construction gang on the Lake Superior & Ishpeming Railway discovered a deposit of non-bessemer ore in a cut near the mine. This may result in changing the route of the line, as the Jackson Company may open a mine there if the find will warrant doing so. The ore is said to be only 7 ft. from the surface.

#### MONTCALM COUNTY.

**EDMORE COAL.**—It is reported that a 10-ft. vein of coal has been discovered on the farm of Henry Hunt, 6 miles southwest of Edmore. A government geologist pronounces it the largest vein yet discovered in the State. The coal is about 70 ft. below the surface. A shaft will be sunk in the spring.

#### MINNESOTA.

(From Our Special Correspondent.)

Some iron ore charters are being made by mining companies at from \$1.05 to \$1.10, and for the season, from the head of the lakes, but the bulk of the vessel business was held over till the question of shipments and price was settled. Now that the allotments are fixed and the pool closed up it is likely that charters will be made with more freedom. Vessel rates are more likely to be less than the present figure than to go higher.

Some explorations are being carried on at the present time on what is called the western Vermilion, an extension of the Vermilion range to the west and south of the Minnesota Iron Company's mines. Some promising finds are said to have been made.

What are apparently large beds of ore have been discovered close to the city limits of Duuth, and options have been taken on all the land in the vicinity. As yet there is nothing in the discovery that is particularly encouraging, as the ore is not of a merchantable quality; but it may improve as explorations are made. Little has been done so far.

#### IRON—MESABI RANGE.

(From our Special Correspondent.)

**ALPENA IRON COMPANY.**—This company, which has some 5,000,000 tons shown up close to the Saunry and the town of Virginia, is negotiating for the sale of the mine.

**CINCINNATI.**—Arrangements have been closed between the fee holders of this property, at the town of Biwabik, which has been practically idle since the stock booming days of 1892, when it was the scene of more stock jobbing than any other property on the Mesabi, so that the mine will be operated this year. The fee holders have reduced their royalty, and the stockholders, many of whom bought stock at 25% on a total issue of nearly \$3,000,000, have agreed to take a royalty of from 5 to 20c., as the condition of the market warrants. As the ore sells at Cleveland they will gauge their receipts, and at the probable price they will get some 15c. a ton. As the mine is not a large one, comparatively, the hope of getting their money back is very slight.

**FRANKLIN MINING COMPANY.**—At the three mines forming this group, and to all intents one mine, about 100,000 tons have been put in the stockpile this week. This does not look as if the company contemplated limiting its shipments for the season to 250,000 tons as allotted, but it has gone into the pool. The new shaft of the Victoria was opened for hoisting this week, and from the Bessemer shaft about 600 tons a day are being raised. The company is mining some good ore, to all appearances, and assays fully bear out the looks of the stuff.

**HALE-PALMER EXPLORATIONS.**—At the explorations carried on in section 34, town 58-17, seven pits are down deep in ore, and of excellent quality. Work is still under way.

**SAUNTRY EXPLORATIONS.**—The report, current in all Mesabi range papers this week, to the effect that the Sauntry had been optioned to the Oliver Mining Company, is untrue, no arrangements of any kind having been entered into by its owners with the Oliver or anybody else. As stated some weeks ago in this correspondence, the owners will do very extensive exploration work this season before offering or making any attempt to sell the mine. They believe it has a vast amount of ore, and that the present work, though showing ore of various grades on five 40-acre tracts, does by no means prove the value of the property.

#### MISSOURI.

##### JASPER COUNTY.

(From Our Special Correspondent.)

**JOPLIN ORE MARKET.**—There was no change in the ore market last week. The top price was \$24.50 for jack and the average was a little better than \$23 per ton. Lead oresold at \$16 per 1,000, with the usual 50c. for hauling. The turn-in was as follows: Joplin, zinc, 1,143,810 lbs.; lead, 311,500 lbs.; value, \$18,716. Webb City, zinc, 362,810 lbs.; lead, 36,910 lbs.; value, \$4,593. Cartersville, zinc, 1,197,500 lbs.; lead, 249,150 lbs.; value, \$17,044. Spring City, zinc, 17,950 lbs.; lead, 27,570 lbs.; value, \$650. Zincite, zinc, 37,290 lbs.; value, \$430. Oronoga, lead, 21,450 lbs.; value, \$328. Galena, Kan., zinc, 2,020,000 lbs.; lead, 400,000 lbs.; value, \$26,600. District totals, zinc, 4,779,370 lbs.; lead, 1,86,890 lbs.; value, \$69,261.

#### MONTANA.

##### CASCADE COUNTY.

(From Our Special Correspondent.)

**BELT COAL MINES.**—F. Lewis is shipping from the Lewis Mine, near Belt, 100 tons of coal per day. The Millard Coal Mine is employing a force of some 20 men on development work. The Castner Coal and Coke Company is working 800 men in its mines, and shipping 90 cars of coal and coke daily. From developments it is expected that this amount will be increased. The railroad is now running three trains a day, conveying this coal to Anaconda.

##### JEFFERSON COUNTY.

**COLUMBIA.**—Messrs. Hoffman and Van Tassel have optioned, for \$25,000, the Columbia mine near Pipestone, owned by Dan McNeill and F. C. Berendes. The new company was to sink 100 ft., prospect 25 ft., and all ore is to be left on the dump. No leasing done at all.

**GRANITE MOUNTAIN GOLD MINING COMPANY.**—A meeting of the stockholders of this company was held in Butte during the past week. The officers who visited the mines recently were favorably impressed with the showing and decided to continue development work. The deepest shaft is down 165 ft. and the stockholders unanimously agreed that the work of development should be pushed to a depth of at least 300 ft. It was then decided to let another contract to sink the shaft another 150 ft., and machinery for this purpose has been shipped to the mine.

**HOMESTAKE.**—Peacock and native copper has developed at a 30-foot depth in the Homestake, says the Butte Miner. The ore chute is increasing in width with depth and recent samples show a good value. It is the intention of the owners to sink to a depth of 50 feet and do some drifting to test the ore chute, and then continue sinking until a depth of 100 feet is made before attempting to do any shipping.

(From Our Special Correspondent.)

**EVA MAY.**—This mine, which was working two shifts in its mine, discharged all the men on the night shift—some 25. The reason given your correspondent by the manager was difficulty in regard to wages and other demands of the men, who belong to the Basin Miners' Union. It seems that the principal reason was the men objected to the wages paid to the surface men.

**FREE COINAGE.**—This has developed into the wettest mine in Lump Gulch. The water has so bothered the miners in their work that but little developing has been done for several weeks. The station pump has been lowered to the 300 level and in all probability the water will be controlled. The owners of the Free Coinage, Messrs. Smith and Prescott, of Helena, have bonded the Little Alma, a very promising property.

**HALDEMAC.**—This property has improved in sinking, the shaft has reached a depth of 180 ft., and the water being troublesome, the proprietors have bought a steam hoist and pump and as soon as the machinery is running sinking will continue to the 200. So far the ore taken from this property has paid for exploiting it.

**HARVEY.**—This mine owned by Dr. C. B. Miller

and W. E. Norris, of Helena, shows a larger vein than any property in Lump Gulch. The vein is claimed to be 30 ft. wide. A shaft has been sunk 100 ft. and a contract has been let to sink 100 ft. more. Some very high grade ore has been encountered in sinking, but no permanent ore shoot has been struck. The vein carries more gold in the ore found than any other discovered in or near Lump Gulch.

#### LEWIS & CLARKE COUNTY.

(From Our Special Correspondent.)

**PORPHYRY DIKE.**—I had supposed from what I had seen of the ground that the greater part of the Porphyry Dike that has been so much talked of during the last three months was in Jefferson County. Dr. A. H. Mitchell, of Deer Lodge, who has considerable interests in claims and mills on the dike, says the greater part of it is in this county, and that a small part is in Jefferson County and a smaller part in Deer Lodge County. Dr. Mitchell is confident that it will pay to crush all the rock in the dike, and that the average yield per ton will be not less than \$3, and that the ore can be mined and milled at something like \$1 a ton. The rock is quarried out in terraces. At the Mollie Stark, owned by the Pauper's Dream Company, the ore is mined this way, three men taking out in 10 hours enough ore to run the 10-stamp mill 24 hours. The mill treats four tons of ore to the stamp in 24 hours. It is believed that more than this amount may be crushed with profit. A strike of considerable importance was made on the Columbia, on the Dyke, owned by Moses Manuel, and it is believed that the ore in that mine will mill at least \$6 to \$8 a ton. The Manuel mill has 15 stamps and is doing good work. I could not learn the amount of ore it is treating. There is every reason to believe that this dike will have 500 men employed upon it before a year, and that the number of stamps now dropping will be increased ten-fold.

West of Helena are several porphyry dikes. In one of these it is claimed that gold has been found in considerable quantities, and that very rich samples have been found. There is no doubt that every porphyry dike in the mountains will be examined this summer for gold.

#### PARK COUNTY.

**BEAR GULCH.**—Col. J. E. Pamplin says of the mines in the vicinity of Bear Gulch: Bear Gulch lies at the foot of Old Baldy mountain, in the chain of the Crevasse mountains. Placer mining was carried on for years, but now only in a small way. The attention of miners has been attracted almost entirely to quartz mining. The veins of free milling gold ore are numerous. The Bear Gulch Mining Company is the most extensive operating there at present, and with only 20 stamps are doing very well. It is the intention of this company to enlarge the mill to 100 stamps as soon as machinery can be placed. The mill is running night and day, and the company employs 50 men. He also states that the mills of the Crevasse Mining Company and the McCauley Company are idle for want of water, and that the Park View Company will build a 100 stamp mill in the spring. There are 200 men now at work in the district.

#### SILVER BOW COUNTY.

**BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.**—We are enabled to state exclusively that Captain Couch's report, which will be presented next week, will show a very large production in 1895, amounting to over 40,000,000 lbs. of copper besides a cash surplus of some \$500,000; bills receivable, \$800,000; a large stock on hand, and, best of all, 100,000 tons more ore in sight than last year, notwithstanding the increased production.

**STEWART.**—Work has ceased on the Stewart, the property of W. A. Clark, just west of the Anaconda. The shaft has reached a depth of 600 ft. and considerable development work has been done on this level, showing ore bodies. The shutdown is said to be on account of a deal pending for a sale in Europe of Mr. Clark's mining interests in Butte. He is now in Paris, and is accompanied by A. H. Wethey, general mining superintendent of the Clark properties in this State. The list of mining property on which the deal is now pending is said to include the Colusa-Parrot, Original, Fashion, Burt, Woolman, Home, one-quarter interest in the Gold Hill, Mt. Moriah, Joseph, Acquisition Spur, Skip, lots 56 A and 56 B, Acquisition No. 55, Little Treasure and the Stewart. The Colusa-Parrot and the Stewart are valuable copper properties and show a good grade of copper ore on the lower levels. The other mines are silver properties.

#### NEVADA.

##### STOREY COUNTY—COMSTOCK LODGE.

**BELCHER MINING COMPANY.**—At the annual meeting of the stockholders of this company, held in San Francisco last week, 77,587 shares were represented, and the following gentlemen elected to serve as officers for the ensuing year: James Newlands, president; A. K. P. Harmon, vice-president, and J. P. Martin, George D. Edwards and James Newlands, Jr., trustees. C. L. Perkins was re-elected secretary, and his financial statement showed an indebtedness of \$2,641.63. W. E. Sharon was re-elected superintendent, and his report showed that during the year they had extracted from the mine and shipped to the Brunswick Mill for reduction 1,610 tons and 950 lbs. of ore, which was taken principally from the old stopes on the 1,000 and 1,100-ft. levels.

**UTAH CONSOLIDATED MINING COMPANY.**—At the

annual meeting of the stockholders of this company, held in San Francisco last week, 77,135 shares were represented, and the following gentlemen elected to serve as officers for the ensuing year: H. B. Havens, president; H. Zadig, vice-president, and E. B. Holmes, A. S. Wollberg and Geo. R. Wells, trustees. A. W. Havens was re-elected secretary, and his financial statement showed a credit of \$2,107. D. B. Lyman was re-elected superintendent. His annual report is quite encouraging and shows Mr. Lyman as being in favor of re-opening the old surface tunnel, starting at a point a little north of the main hoisting works building and running westerly therefrom towards the prominent surface croppings which are visible all along the mountain top from the Sierra Nevada Company's claim past the northern limit of the Utah Company's claim. He is advised that this west tunnel was advanced west a certain distance without cutting the foot or west wall of the Comstock lode. He is also informed that this west tunnel passed through narrow quartz streaks that gave a low assay value, and that very little prospect work has been done through this surface tunnel. With two miners employed this tunnel can be reopened, track laid and put in good working order without any great outlay of money.

NEW MEXICO.

SANTA FE COUNTY.

ORTIZ.—There are about 25 men employed at this mine and mill. A new Huntington mill was lately put in operation there.

OHIO.

NOBLE COUNTY.

CALDWELL OIL FIELD.—Renewed activity is reported in the Macksburg oil field at Caldwell, and it is expected that a great deal of work will be under way before spring. This is one of the fields in which development is stimulated by the continued good market. Most of the wells are less than 400 ft. deep.

PENNSYLVANIA.

ANTHRACITE COAL.

BOSTON.—These mines after being idle for near to three months have resumed operations. The squeeze has settled and everything appears to be quiet where the cave-in was expected to occur. Mine Foreman Gwilym Evans, accompanied by the head officials from Scranton, made a tour of the workings on February 1st where it was supposed to be dangerous. They finally decided to resume work. All chambers and workings on the Plymouth side of the slope have been abandoned, fearing that in working these places that it may leave the workings in a more dangerous condition. About 1,000 men and boys will be re-employed.

BUCK MOUNTAIN VEIN.—The tunnel bored by Coxie Bros. & Co. to tap the coal in the old Buck Mountain vein was finished on February 1st. It was commenced about five months ago. After boring through solid rock for half a mile the vein was struck. The coal will be taken out of the mine by the tunnel and carried by a surface route to the Eckley breaker. The old Buck Mountain mines were abandoned about 10 years ago, the company thinking then that the coal had been all taken out. Since Coxie Bros. have taken the mine in charge it has been found that not more than 30% had been extracted, and that the mines will last for years.

EAGLE HILL.—This colliery, located about two miles from Pottsville, one of the large operations of the Philadelphia & Reading Coal and Iron Company, took fire on February 3d. The fire is in the west Skidmore gangway and started in breast No. 20. A pipe line about 2,800 ft. long is pouring a stream upon the fire. A portion of the gangway has closed in and this will prove a serious obstruction to the prompt extinguishment of the fire. The colliery, when in good working order, ships between 16,000 and 20,000 tons of coal monthly, and employs 500 men and boys.

MR. PLEASANT COAL COMPANY.—The workmen engaged for some time in drilling on City Engineer Phillips' property have completed their work after going to a depth of 185 ft., and will now transfer their efforts to a point north of Rebecca avenue, says the Scranton Tribune. The object is to find the exact location of a fault in the coal stratum that occurs between Geraldine court on the east and Rebecca avenue on the west, and Mr. Phillips' property is about on the eastern edge of the fault. The Mount Pleasant Coal Company owns the coal and intends to mine the surface vein further west.

SCHUYLKILL COAL EXCHANGE.—The following collieries having been drawn to return prices of coal sold in January, 1896, to determine the rate of wages to be paid, make the following returns: Knickerbocker, \$2.29; St. Nicholas, \$2.39; Boston Run, \$2.25; Eagle Hill, \$2.20; Monitor, \$2.07. The average of these rates is \$2.26, and the rate of wages to be paid for work in the last half of January and the first half of February, 1896, is 9% below the \$2.50 basis.

SEVENTH ANTHRACITE DISTRICT.—Last month was one of the most disastrous in and around the mines of the Seventh Anthracite District. During that period 16 employees were killed by accidents, 16 others received serious injuries, and there were no less than 60 minor accidents. The number of lives lost was as great as usually occurs in four full working months of average years.

BITUMINOUS COAL.

CLEVELAND GAS COAL COMPANY.—The miners'

wages have been reduced by this company from 64¢ to 59¢ a ton. As all operators and miners had recently agreed on 64¢, this break was not expected and it is likely to stir up one of those almost endless controversies that the soft coal regions are forever suffering from.

SOUTH DAKOTA.

LAWRENCE COUNTY.

TORNADO.—A rich strike was made recently in this mine, situated in the silicious ore belt. The ore was discovered at a depth of 325 ft., it is reported, and assays well.

TENNESSEE.

MORGAN COUNTY.

CHATTANOOGA OIL AND GAS COMPANY.—This company was organized at Chattanooga recently to deal in oil lands in this county. The chief purpose of the company is said to be speculation, but they will also sink several wells. Col. Ed. W. Watkins was elected president, A. L. Ross, vice-president, and C. A. Lyerly, secretary and treasurer.

UTAH.

JUAB COUNTY.

AJAX MINING COMPANY.—At the annual meeting it was decided to increase the board of directors to seven, and George A. Lowe and W. H. King were added, which leaves the personnel as follows: Samuel McIntire, Henry M. Ryan, Will G. Nebeker, Ike Jennings, Frank Knox, George A. Low and W. H. King. Reports from the property denote good results from recent explorations, says the Salt Lake Tribune, and the property shows a new ore body below the 400-ft. level. The experience at the Ajax is said to have been a reproduction of the experience among its neighbors, the gold values having increased as depth was attained.

WASHINGTON.

KING COUNTY.

GREAT NORTHERN COAL MINING AND MINERAL COMPANY.—This company, which has been doing development work in its mines at Skykomish for some time past, has recently struck a seam of coal said to be 12 ft. thick. This is only one of several seams, it is reported, "that the company has partially developed on its property, all of which are of the same character. The company's mines are within three quarters of a mile of the Great Northern Railroad, and admirably situated for handling the coal produced."

LINCOLN COUNTY.

IRON CROWN.—This claim, located in Mill Canyon, about 10 miles northeast of Davenport, is being developed. A year ago a 30-ft. shaft was sunk in the ledge and a crosscut of 22 ft. was made at the base of the shaft cutting the ledge from one side wall to the other. At the present time two shifts of men are driving a tunnel which will strike the ledge about 100 ft. from the surface, and when completed will be about 120 ft. long. They are in with the tunnel over 25 ft. now. Assays show good returns in gold. The ore of the Iron Crown is said to resemble Trail Creek ore.

WYOMING.

FREMONT COUNTY.

BIG HORN MINING COMPANY.—This company, of Sheridan, has filed articles of incorporation with the secretary of state, and will at once commence the work of developing its mining property in the Bald mountain gold district. The company owns 300 acres of land showing rich beds of the gold-bearing cement of the region. The incorporators of the company are G. W. Holdrege and C. N. Deitz, of Omaha; R. R. Woods, B. F. Perkins and E. E. Lona baugh, of Sheridan.

CRANIER.—Messrs. Mendall and Edwards, who have bought the Cranier properties at Atlantic City, have employed an expert in hydraulic mining methods to take charge of the mines which will be reopened and worked to their full capacity in the spring.

FOREIGN MINING NEWS.

NEW SOUTH WALES.

BRITISH BROKEN HILL PROPRIETARY COMPANY.—The report of this company for the half year ending June 30th last shows that a large amount of work has been done with favorable results as regards reserves of both carbonate and sulphide ores brought in sight. The ore sold during the half year amounted to £5,246, and after paying all expenses it yielded a good net profit, leaving on hand 4,000 tons of ore. The board of directors, after careful consideration, authorized the erection of a concentrating plant capable of treating 2,000 tons weekly and putting this amount of ore in the form of shipping ore. The treatment of sulphide ores is engaging the attention of the directors and they have been watching the action of the Broken Hill Proprietary Company and others on the Barrier Range. In the meantime it is the intention to carry out concentration on a large scale, and the concentrated ore can be readily disposed of at a profit.

BROKEN HILL PROPRIETARY COMPANY.—The preliminary statement for the half-year ending November 30th shows that the net profit for that period was \$1,462,500. The profit and loss account on November 30th showed a credit balance of \$3,305,000. Assets consisted of cash, \$675,000; securities owned, \$375,000; bullion and stocks on hand, \$2,100,000; total, \$3,150,000. The fire in the mine is

not quite out, but is confined to a small area and no further trouble is expected. The cost of the fire and damages have amounted to \$100,000. The average yield of ore extracted for the half year was \$17.50 and cost of mining and working \$11.25 per ton. The sulphide ores in the lower levels have come fully up to expectations.

NORWAY.

ROROS COPPER WORKS.—The proprietors have placed a contract with a Christiania firm for a large electrical plant, it being intended to light the mines, as also to operate the mining machinery, by electricity.

ONTARIO.

(From an Occasional Correspondent.)

BAD VERMILLION AND LITTLE TURTLE LAKES.—Four new claims are opening out here, the most advanced of which is that of W. E. Stone, of Connecticut. Mr. Stone has erected a rather effective, if somewhat primitive, 3-stamp mill; also an amalgamating plant and is obtaining gold from claims 237 E and 238 E. Stone's shaft is down 16 ft., showing some native metal. The mill rock is chiefly ferruginous quartz and from near surface very free and decomposed. The fact of the government granting titles for claims upon Timber Berth 34 (Bull's) will give great impetus to mining in this region.

BULL CLAIMS.—The government of Ontario have at last issued titles to Bull et al.

LATE NEWS.

COLORADO.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

BURNS.—This property, adjoining the Pharmacist on Bull Hill and formerly owned by the Calumet Company, has shown steady improvement in the hands of the lessees. A rich seam showing tellurides and free gold was struck last week in the 85-ft. level. The shaft will be sunk an additional 100 ft., making a total depth of 260 ft.

ELKTON.—This property continues to improve, and the shaft has now been sunk 70 feet below the 300-ft. level, and the pumps handle the water easily.

KING OF DIAMONDS.—This mine, three miles north of Cripple Creek, has recently been equipped with a horse whim. The shaft has been sunk 90 ft. vertically on the vein, and from the bottom of the shaft a crosscut east was extended 25 ft. when a second vein was encountered 5 ft. wide, which assays close to \$20 per ton, and which, without sorting, is being hauled to the Brodie Cyanide Mill. Now the old or main vein will also be developed by drifting north. This property is being worked under lease.

LINCOLN.—This is also being worked on lease. The shaft has been sunk 75 ft., and development on the vein is the programme. A horse whim is used to raise the ore which samples from 2 oz. to 3 oz. This section of the camp has of late attracted considerable attention.

PHARMACIST.—This mine made a 2½-ton shipment this week, 9 tons of which came from the 4th level or from the new vein. The balance came from the shaft at the 620 ft. and is supposed to sample about 12 oz. per ton. The shaft will be sunk again during the week. There are 28 men employed now and 8 additional miners on development alone.

RAVEN.—This company is erecting a large sorting house and ore bins, and is making preliminary arrangements to sink a deep vertical shaft on the Gregory claim. As soon as the sorting house is completed, a large number of men will be employed in stopping the reserves already blocked out and in development.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 7.

Statement of shipments of anthracite coal (approximate) in tons of 2,240 lbs., for the week ending February 1st, 1896, compared with the corresponding period last year.

Table with 3 columns: Line, 1896 Week, 1896 Year, 1895 Year. Rows include Pennsylvania Railroad, Phila. & Reading Railroad, and Totals.

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

Table with 3 columns: Line, 1896 Week, 1896 Year, 1895 Year. Rows include Shipped East and North, Allegheny, Pa., Barclay, Pa., Becon Creek, Pa., Broad Top, Pa., Clearfield, Pa., Cumberland, Md., Kanawha, W. Va., Phila. & Erie, and Pocahontas Flat.

Table with 3 columns: Line, 1896 Week, 1896 Year, 1895 Year. Rows include Shipped West, Monongahela, Pa., Pittsburg, Pa., Westmoreland, Pa., and Grand totals.

**Anthracite.**

The anthracite coal trade has not yet recovered from the effects of the astonishing promptness with which the great companies last week decided to cease doing a profitless business. It is too much to say that buyers are in a stupor for there are still a great many inquiries as to the possibilities of getting "reasonable concessions," but business is very slack indeed.

It would be too much to expect, even by the most sanguine of sales agents, that buyers should display any great desire to increase their stocks just now. We find that dealers as a whole are well enough supplied to be able to hold off for say four weeks to come. Just before the advance the majority of sellers booked low priced orders which cannot be entirely delivered until the latter part of this month so that no great scarcity of coal is feared by dealers. Again, such weather as we have been treated to of late, does not help the domestic fuel consumption much. So, all in all, the present dullness, which is very great, is easily accounted for.

So far as prices are concerned, there is much to say that is apparently conflicting. It might be stated, without great fear of contradiction, that none of the companies is selling any coal at the circular. On the other hand, after a thorough canvass of the trade, we may say that no company is selling below the circular. In other words, as a week is too short a time for anybody, even an anthracite sales-agent, to be guilty of a glaring breach of faith, none of the companies is doing any business just now. That before long the demand is bound to improve goes without saying. A prominent official of a company whose president is one of the committee which is to arrange for a working plan, said, not altogether ingenuously: "The companies will do their best to adhere to their allotments, for we recognize that if this is done prices will regulate themselves. And so we simply bide our time now. We know we have a certain output to mine, and whether we sell the coal now or a month or six months hence does not disturb us."

To a greater or less extent this is practically the attitude of the majority of the prominent interests, but the logic of it is not of the "inexorable" kind which we are wont to associate with certain well-known events. Thus, it is easy to be good when there is no temptation to be bad. How will the companies act in the naturally dull spring? June, it must be remembered, has been the coal companies' Rubicon in past years. Again, the capacity of the country for not consuming coal when prices were high was the undoing of the trade on a previous occasion. Are the storage capacities of the companies so largely increased and their financial condition so greatly improved that all the companies can afford to carry large stocks of unsold coal this year? To-day everything favors producers. The reaction against the senseless policy of selling at any price has not yet worn off and doubtless we shall see the "recommended" restriction in the output more closely adhered to than has been the case for many a month past. There is no especial inducement to "shade" prices just now, and in giving company prices we have little hesitation in reprinting the circular, which is \$3.60 for stove, \$3.35 for egg and chestnut, and \$3.10 for broken. The same applies to some of the largest middlemen.

On the other hand, there are certain commission houses and independent operators who, as usual, are not adhering to the circular. Their reason for not doing so may be found in the statement of a well-known operator, who said: "The companies took orders at the prices ruling a fortnight ago, which cannot be delivered before the end of this month. We could not do likewise, but in order to protect our customers we are compromising with them by asking only a part of the advance." In short, good stove coal may be bought in some quarters at 15c. to 20c. below the circular, though it is but proper to state that any active demand would soon put an end to these "concessions."

The Assembly of this State has passed a resolution calling for the appointment of a committee to "investigate the coal trust," and another directing the Attorney-General to do it and see just where the law is violated. The Senate has laid on the table both resolutions. It strikes us that our well-meaning Assemblymen would have saved themselves both time and perturbation by reading the *Engineering and Mining Journal*. There is to-day no violation of the letter of any State or Federal "anti-combine" law in the coal trade, and, therefore, nothing to investigate. Whatever plans the Committee of Five may decide upon for the conduct of the anthracite trade, it may be safely foretold that able legal talent will be consulted before their adoption.

The *Engineering and Mining Journal* has always been, and will always be, the implacable foe of anything that savors of illegal "trusts" or "combines." It is only justice to an industry that feeds and clothes thousands of families and has invested hundreds of millions of dollars in collieries and plants that it should not do business at a loss. If ever the odious terms of "grasping monopolists" and "bloated coal barons" was undeserved by the owners of anthracite coal mines, it has been during the past two years. And if ever the public bought at remarkable cheapness an article of the first necessity, it was, or should have been, anthracite coal, ever since July, 1894. If coal has not been so bought it has been the fault of the retail dealer, and not of the "coal barons."

Let the legislatures and the public rest easy. Nothing short of an illegal and therefore impossible combination, can produce extortionate prices

for anthracite coal. And if some arrangement by which the spirit if not the letter of the law is violated, should be arrived at and prices advance unduly, it would not be long before the trade would be in a demoralized condition. Prosperity, in the way of high prices, does not agree with the anthracite companies, for it induces over-production as surely as over-production leads to low prices. The annual reports of the great anthracite companies, for 1895 show that there was little or no profit—and in some cases actual losses—in the coal business last year. And as these companies, like politicians, are not doing business for their health, it is illogical to expect them to continue the philanthropic policy of supplying coal to the public at a loss.

The public should read the *Engineering and Mining Journal*, which is impartial, find out the price at which a dealer can buy his coal, and compare it with the figures at which he sells it, bearing in mind the fact that the dealer buys a long ton and sells a short one; how short it is difficult to say, but he gains in this way at least over 10%. When the wholesale sellers enter into combinations or agreements detrimental to the common weal they will find us against them, and it will then be time for legislative action and public indignation. The last and much condemned advance has not put a cent into the treasuries of the "grasping" coal companies as yet. And the dealers who have advanced prices 25c. or 50c. are simply selling at a higher price the same coal which they bought at low figures weeks ago and which they were very willing to sell at a lower price in January.

**NOTES OF THE WEEK.**

The Delaware, Lackawanna & Western Railroad Company's statement for the year ending December 31st, 1895, is as follows:

	1895.	1894.	Increase.
Gross.....	\$14,201,909	\$13,053,862	\$1,148,047
Operating expenses.....	37,441,039	36,009,195	1,431,844
Net.....	6,768,900	7,449,667	*288,767
Fixed charges.....	5,406,539	5,412,323	*6,084
Balance.....	1,351,661	1,677,344	*225,683
*Decrease			

Dividends, \$1,831,000; deficit, \$479,339, against a deficit in 1894 of \$196,636. The net profit of company for 1895 was equal to 5.17% on the capital stock, against 6.24% in 1892, 11.74% in 1891, 10% in 1890 and 8.20% in 1889. The coal transported in 1895 was 7,987,20 tons, against 7,822,476 in 1894 and 9,529,883 tons in 1893.

**Bituminous.**

There seems to be a few more orders in the market, but the greater part consist of extra cargoes which contract customers have been induced to take. The balance is "transient" trade. This has merely relieved the dull monotony of business which during the past few weeks has been practically nil, and has necessarily increased shipments somewhat. There has been a slight shortage of coal at shipping ports with a number of the shippers caused by the loading of the one or two orders that consignees have been to procure charters for. In most of the orders from old contracts prices are made "delivered," and thus are favorable to consumers, who being apprised of the advance on railroad rates to go into effect April 1st, take advantage of present rates to get cheaper coal with which to replenish their stocks. Present conditions are not favorable to sellers, who are beginning to look forward to the early opening of the season, when contracts commence to be placed.

Most of these new shipments on old contracts come from the far East, New England ports, which makes that particular consuming territory seem more active in contrast to what it has been of late. Shipments to Sound ports have fallen off slightly. The all-rail trade is about as steady as usual, though slightly reduced in tonnage. In this line of the trade some contracts have been figured on, and the fact that the figures mentioned are no better than last year's, is not encouraging to sellers, and does not augur well for the probabilities of a "combine."

Transportation from mines to tide is good, and the car supply is likewise. The supply of vessels has been rather better than the supply, and the coastwise freight market has been weak. We quote as follows from Philadelphia: To Boston, Salem and Portland, 75@80c; Providence, New Bedford and other Sound ports, 70c; Portsmouth, 80c. From Baltimore and lower ports rates are 5c. to 10c. higher.

Nominal prices are unchanged. We quote f. o. b. at the various ports, as follows: Norfolk and Newport News, \$1.9 @ \$2.15; Baltimore, \$2 @ \$2.20; Philadelphia, \$1.75 @ \$2.20; New York harbor shipping ports, \$2.20 @ \$2.65; alongside New York harbor, \$2.40 @ \$2.75; alongside Boston, \$2.75 @ \$3.

In reference to the much talked-of combination of soft coal interests, the usual crop of rumors and reports circulated among the trade this week. The statements about it, if anything were ever stronger than they have been. Some producers who will be included in whatever plan is decided upon, and who, therefore, should know, state that there is a very strong probability of its effectiveness, and that assurances have already been secured of the co-operation of the main line roads. If this is true some sort of a "combine" may be looked for, though such details as have been given out, make it look as if the plan will be of too complicated a nature to make its success likely with the diversified, and in some cases conflicting interests of the companies concerned. A general meeting of the producers

will be held in Philadelphia on February 14th, at which the affair will probably be decided one way or another.

**NOTES OF THE WEEK.**

The annual meeting of the Huntingdon and Broad Top Mountain Railroad and Coal Company was held in Philadelphia on February 4th, and the old management was re-elected, as follows: President, Spencer M. Janney, directors, James Long, James Whitaker, Thomas R. Patton, Jacob Naylor, William Bault, Samuel Bancroft, Jr., George H. Colker, Robert H. Crozer, William H. Shafercross, Lewis A. Riley, Harrison K. Caner and Charles S. Farnum.

The total receipts were \$613,003 and the total expenses \$295,982. The earnings over expenses for the year 1895 were \$357,020, as compared with total net earnings of 1894, of \$313,810, showing an increase for the year 1895 of \$43,210. There were moved in 1895 a total of 2,839,066 tons, as compared with 2,331,276 tons for 1894, showing an increase for the year 1895 of 507,790 tons. President Janney, in his report, says: "The shipments in 1894 of coke were 20,294 tons, while in 1895 they were 56,137 tons; of ore and limestone in 1894 they were 45,175 tons, while in 1895 they were 116,23 tons; of pig metal and other iron they were about double what they were in 1894; while miscellaneous freight of all descriptions, local and otherwise, shows a gain for the year of 36,939 tons, or nearly 20%. The industries on the line of the road have shown a condition of much greater prosperity during the last six months than for some time back. It is reasonable to expect that the natural increase in the consumption of bituminous coal will cause even larger shipments during 1896 than during 1895."

**Buffalo, N. Y.**

Feb. 6

(From Our Special Correspondent.)

The anthracite coal trade is without much activity as the weather has been, and is, to-day very mild comparatively speaking, and not necessitating any very great consumption of fuel in houses. Prices unchanged wholesale and retail. Stocks ample.

Bituminous coal only moderately active; many manufacturers have large supplies on hand delivered last fall or early winter. The quotations are nominally unchanged; continuing to rule very low much to the disgust of mine operators. Several of our local dealers have gone to Montreal to compete for the fuel necessary for the Grand Trunk Railway of Canada for the next 12 months.

The results of the meeting of the coal men in New York is still the principal topic of discussion among our dealers, but it is a matter containing no new material for further notice here.

The Queen City Gas Company has not as yet commenced operating in this city. Yesterday the company received official notice from the Board of Public Works that if they were not ready to supply gas six months from date, their charter would expire by limitation. The only indication of business is a stack of gas pipes on the banks of the Erie Canal.

Very open weather has prevailed over Lakes Huron, Superior and Michigan thus far this winter, and but little ice is to be found and that of no very great thickness.

A Cleveland paper says: "The members of the Lake Carriers' Association who are most interested in the coal carrying and fueling question, after giving the matter careful consideration, have tacitly agreed to let the Buffalo agreement of last year stand for the coming season, and not to try to extend it to Ohio soft coal ports, where fueling arrangements already have been made by several parties at \$2.15 per ton."

The National Board of Trade last week indorsed the recommendations of the Water Ways Committee, looking to the deepening of the channels of the Great Lakes to a width of about 600 ft., and for the opening of deep-draft connections between the lakes, the Ohio and Mississippi rivers and the Atlantic.

**Chicago.**

Feb. 5.

(From Our Special Correspondent.)

There has been but little improvement in coal trade at this center, weather conditions still entirely governing business. Everybody appears to get along with about half the usual supply of coal, and the hand to mouth policy was never more noticeable. It is strange that the coal business here is so inactive for general trade conditions are much better than a year ago. Some of the extensive steel and iron plants at this point are now starting up, and this may have the effect of increasing trade all around. The South Chicago plant of the Illinois Steel Company being again in operation the consumption of coal there will be very large. There are no steady prices in either anthracite or bituminous coal, and apparently any are made to catch business. The circular rates on hard coal are \$5 @ \$5.50. Cars are accumulating on the tracks and they are becoming a problem for somebody. Coke is not in good demand and its price is weak.

**Pittsburg.**

Feb. 6.

(From Our Special Correspondent.)

**Coal.**—The unexpected happened; we have coal-boat water when nobody was looking for it. It came so soon after the preceding rise that only a limited amount of coal was loaded with few tow boats in port. The rise will enable all the boats on the way up with empties to reach port and will insure work for the miners for some time to come.

De Armit's cutting of wages makes the mining situation grave. The men are moving carefully



and the Miners' Executive Committee advises against further reductions. There was consternation and surprise among miners and operators over the announcement by President De Armit, of the New York & Cleveland Gas Coal Company, that true uniformity did not exist in the district, and therefore his company would reduce the pay of its miners 10c. per ton: unless settled a strike will follow.

A big demonstration was occasioned at Mobile on January 31st, by the arrival of the first barges of coal from Tuscaloosa, thus placing Mobile in communication with the coal fields of Alabama by water. The event caused great rejoicing.

**Connellsville Coke.**—Trade suffered a heavy falling off in production and shipments last week. The six-day list of ovens remained about the same as the week previous, but the five-day list was largely reduced. Nearly the entire list of 9,877 ovens making five days the week previous was cut down to four-day run last week, and over 500 ovens only made four days. For the week production fell off 5,826 tons, and the shipments show a decrease of 8,414 tons. There were 621 ovens blown out and the indications point to blowing out of nearly the same number this week. Furnacemen continue to cut down their orders for coke, and are running on barely the needs of the day, and in some cases where heavy stocks of coke have been piled up shipments have been cut off entirely. The prediction made a few days since that rock bottom had been reached in the dropping off in demand for coke seems to have been premature. Estimated production was 118,760 tons, and the shipments were 6,002 cars, and were distributed as follows: To Pittsburgh and river points, 1,662 cars, an increase of 50; to points west, 2,954 cars, a decrease of 87; to points east, 1,386 cars, a decrease of 424 in tons. Prices show no change.

**Shaohai, China.** Jan. 3.

(Special Report of Wheelock & Co.)

**Coal.**—The natives seem to be still holding out on Japan coal, waiting for cheap freights, as it is impossible to obtain any offers. Large contracts, particularly in Mike coal, have, however, been made for supplies to consumers for the current year at various prices. There was an arrival of about 1,500 tons of Card ff coal from Hongkong, which was ordered by natives some little time ago. There is no demand for American anthracite, except in small parcels for house use. The market for Sydney Wollongong is very dull and inactive. Quotations are: For American anthracite, 9'00 taels per ton; Welsh Cardiff, 10'50 taels per ton; Australian Wollongong, 9'50 taels per ton. For Japan we quote: For Takasima lump, 5'75 taels per ton, and for Namazuta lump, 4'75 taels per ton; other sorts, 3'25@3'50 taels per ton for such as can be procured.

**Kerosene Oil.**—During the past fortnight business has been unusually quiet, the usual transactions at the tea-shop being the order of the day, but only in small quantities. Our stocks in godown are now represented by 366,919 cases American and 293,623 cases Russian. We quote: For American, Devoc's, 1'72 taels per case, and Chester, 1'65 taels per case; Russian, Batoum, 1'65 taels per case, and Bitoum ouik, 1'55 taels per case.

We give our kerosene oil statistics for the year 1895 as follows: American arrivals were 1,706,171 cases; stock on hand January 1st, 1895, was 826,313 cases, making a total supply of 2,532,484 cases for the year. Deducting the stock on hand on December 31st, 1895, which was 366,900 cases, we have 2,165,584 cases, as deliveries during the year. Russian arrivals were 1,231,447 cases, and the stock on hand January 1st 1895, was 243,271 cases making a total supply of 1,474,718 cases for the year. Deducting the stock on hand on December 31st, 1895, which was 293,623 cases, we have 1,181,095 cases as deliveries for the year 1895.

**IRON MARKET REVIEW.**

**NEW YORK, Friday Evening, Feb. 7, 1896.**

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

Fuel used.	Week ending		From Jan. '95.	From Jan. '96
	Feb. 8 1895.	Feb. 7, 1896		
	F'ces.	Tons.	F'ces.	Tons.
Anthracite.	38	21,632	53	76,700
Coke.....	124	147,123	169	189,200
Charcoal...	23	5,140	21	4,900
Totals	185	171,895	240	221,800
			957,700	1,204,057

The iron market this week has recurred temporarily to the waiting condition, not at all in the same sense as we used the term several weeks ago, but because of the general business situation. In this, as in all business there has been a pause due to the state of the financial markets and because there was still some uncertainty as to the result of the bond issue. The great success of that issue, as noted in another column, will give the iron market an upward turn, the effect of which will quickly be apparent.

While the incipient boom of two weeks ago in Pittsburgh very soon subsided, our reports from the different iron centers show an undercurrent of strength which promises well for the future. Demand for raw material continues good, and with improved financial conditions it will improve.

**NOTES OF THE WEEK.**

The Wire Nail Manufacturers' Association has given notice of an advance of 15c. per 100 lbs. all around, raising the base rate from \$2.25 to \$2.40 per

100 lbs. This is the highest rate yet reached; in the early part of 1894 the rate was 85c. @ \$1.

A statement prepared by the Bureau of Statistics, Treasury Department, shows that the United States exports of iron and steel (including all manufactures of the same) in 1895 were valued at a total of \$35,071,535. In 1890 the amount was \$27,000,134. The increase in quantities was greater than is shown here, owing to the lower prices last year.

The Cambria Iron Company reports for 1895 an increase of 23% in amount of business over the preceding year. The company paid \$200,000 dividends and spent \$293,185 in improvements of its property. The dividends were 4% on the stock.

**New York.** Feb. 7.

The local market has followed the general conditions sketched above. There have been few large transactions, negotiations of that class having generally been held in suspense until the financial situation should be better defined. There continues to be a good run of small orders, however, and these make in the aggregate a fair amount of business.

**Pig Iron.**—The smaller foundries in this district seem generally to be putting in pretty good stocks, as the buying has been very fair. Prices are generally well maintained, and there are fewer reports than usual of cutting to secure business. There are indications that more Southern iron will be placed here this year than last.

We quote, without change, for tidewater deliveries: Northern iron, No. 1 foundry, \$13.25@13.75; No. 2, \$12.25@12.75; gray forge, \$11.75@12.25. For Southern iron prices are: No. 1 foundry, \$12.50@13; No. 2 foundry \$12@12.50; No. 1 soft, \$12.25@12.50; No. 2 soft, \$11.75@12; forge, \$11.50@11.75.

**Cast Iron Pipe.**—Inquiries are increasing, and, while no new contracts are reported closed this week, the foundries are preparing for a good business.

**Spiegel-isen and Ferro-Manganese.**—The market is still quiet, and prices are again lower. We quote \$18.50@19.50 per ton for ferro and \$24@25 for spiegeisen.

**Steel Billets and Rods.**—More sales of billets are reported and more inquiries. Billets are \$20@21 at tidewater; rods are a shade higher, say \$26.50 @ \$27.50 at tidewater.

**Merchant Iron and Steel.**—Business has been good, chiefly in small orders. Prices show no change. 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, 1'65@1'75c.; steel axles, 1'65@1'80c.; links and pins, 1'60@1'75c.; 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.**—Business has been fair and prices are unchanged. Prices for 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 are reported closed for several large buildings downtown. Negotiations are pending for two or three of the new buildings for Columbia College, that for one of the group having been let. No change in prices is noted, and 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@1'70c. for large lots and 1'80@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. It is reported that a contract has been let to an Eastern mill for 12,000 tons of rails for Chile, but no particulars can be obtained.

Rail fastenings are steady and prices unchanged, except for fish plates, which are a little lower. 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.**—Demand for foundry scrap is good and we quote \$9.50@11 per ton, according to size and quality of lots. The better class of scrap is scarce, though there is plenty of poor stuff.

**Chicago.** Feb. 5.

(Special Report of Rogers, Brown & Co.)

There is a much larger inquiry and a considerable increase in actual transactions, sufficiently general and scattered to suggest the possibility of another buying movement having set in. Several negotiations have developed the fact that there exists a well-defined bottom, below which furnaces will not go. The figures given below represent the average price in this market: 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; Jack-on County silvery, No. 1, \$15.25@15.75; Southern soft No. 1, \$12.50; Southern soft, No. 2, \$12.50; Lake Superior charcoal, \$15.50.

**Chicago.** Feb. 5.

(From Our Special Correspondent.)

The better feeling noticed during the past few weeks in trade at this point has not subsided, and there is now a tendency to expand. At most all

kinds of iron are in good demand and some good-sized contracts are being booked or are now in the market. Steel rails and billets are in more active demand. Wire nails will be increased in price 15c. per 100 lbs. to take effect March 1st. A similar advance in cut nails will be made.

**Pig Iron.**—The week has seen as much buying as its predecessor. Sales as high as 2,000 tons were made and the week's aggregate shows well that there is a rush to cover wants at prevailing prices. It is expected that increased prices will soon prevail. Some large contracts are being figured on. Both northern and southern iron was bought freely during the week, about an equal amount of both irons changing hands.

Prices are: Lake Superior charcoal, \$14@15; local coke foundry No. 1, \$13.50@14; No. 2, \$13@13.50; No. 3, \$12.50@13; local Scotch foundry, No. 1, \$13.50@14; No. 2, \$13@13.50; No. 3, \$12.50@13; Southern coke, No. 2, \$12.10; No. 3, \$11.85; Southern, No. 1, \$12.35; No. 2, soft, \$11.85; Southern silveries, No. 1, \$14; No. 2, \$13.50; Jackson County silveries, \$14.50@16; Ohio silveries, No. 1, \$13.50; No. 2, \$13; Ohio strong softener, \$15@15.50.

**Structural Material.**—There is a good business going on in building shapes for buildings in and out of this city. A Chicago company has secured the contract for the steel and iron work above the fourth floor of the new post-office building at St. Paul. The contract amounts to \$25,500. Prices are: Beams and channels, 1'70c.; angles, 1'50@1'55c.; plates, 1'60c.; tees, 1'70@1'75c.

**Bar Iron.**—Business in bar iron is good and several round lots were placed. The Bar Iron Association met at Cleveland during the week and, it is said, reaffirmed the old price list which was based on a rate of \$1.35 per 100 lbs. delivered at Chicago. It is also said that the output will be regulated, 80% of the manufacturers having agreed to do so. Chicago prices of common iron is 1'30c. and 1'40c. for guaranteed.

**Billets and Rods.**—Some good sized orders for billets were booked and inquiry is large. Billets are quoted around \$20. Rods are not in much demand.

**Steel Rails.**—No extensive business has yet appeared. Small sales are being made and inquiry is active. Rails are quoted \$20 and up, according to specification.

**Merchant Steel.**—The prevailing low prices is doing much toward increasing sales. Business for the week was large and inquiry extensive. Prices are: Smooth finished machinery, 1'75c.; smooth finished tire, 1'65@1'70c.; tool steel, 5'50@7'50c.; specials, 11c. and upward; Bessemer bars, 1'50@1'60c.

**Cleveland.** Feb. 6.

(From Our Special Correspondent.)

**Iron Ore.**—The sales-agents of ore are now enjoying a vacation. Many of them are out of the city and there have been no transactions in the new ores. The sales of dock ore are few and unimportant. While prices have not yet been fixed for this year furnacemen are generally expecting to pay about \$4 for standard ores like the Norrie. The situation as to the Bessemer is quite strong and the ability of the sellers to hold prices at the figures which may be fixed upon, is widely recognized at this time, but the question of non-Bessemer is more difficult. A price as light as \$3 has been named as probable, but a more conservative estimate is \$2.75.

**Pig Iron.**—Succeeding a marked activity last week pig iron, in the local market, has been very quiet. There are no sales to speak of in Bessemer pig. Furnacemen are, as a rule, holding firm at \$13 in the Valley's, but some small sales are reported there at \$12.50. Producers are, as a rule, in a much better condition financially than they were a year ago. The heavy orders of last year are pretty well cleaned up and as yet there are few new orders coming in. In the foundry irons business has been somewhat more active, though prices are weaker. No. 1 Northern strong, is quoted in Cleveland at \$13.75; No. 2 at \$13.25; Ohio Scotch, No. 1, \$13.25@13.50, and No. 2, \$12.75@13. Lake Superior charcoal is also off considerably, sales being reported this week at \$14.25. Southern irons are also lower in this market.

**Steel.**—Billets are weaker and sales have been made at \$17.25. Heavy plates are quoted at \$1.40 at mill. Some inquiries for good sized orders are being made but the spring trade has not opened.

**Pittsburg.** Feb. 6.

(From Our Special Correspondent.)

**Raw Iron and Steel.**—There has been in some respects a moderate improvement in the business situation in certain departments of trade, but generally speaking, the market was a waiting one, with trade quiet, there being a difference of opinion in regard to values. But conditions are brightening steadily, and there is less apprehension of future stringency. Iron trade conditions have maintained the recently noted improvement to a moderate extent, and while buying generally has been on a conservative basis, there has been more activity in some departments. An American mill has secured a 2,000-ton contract for steel rails for Pacific Coast delivery in competition with foreign makers, and several good-sized contracts for plate and structural material have been recorded. While there has been no improvement in prices, the undertone is stronger, and there is more confident expectation of expanding activity in trade and a gradual betterment of values. The requirements of the spring trade are certain to be large if prices are not advanced so far as to prevent consumption, and a

steady and moderately profitable business is reasonably assured. The Cambria Iron Company has banked its furnaces at Hollidaysburg and Johnstown. The suspension of work will greatly affect the mountain coal operators who supply the works with coal. The stoppage of operations will last a month. The Bar Iron Association has reaffirmed the old price list, which was based on a rate of \$1.35 per 100 lbs. delivered in Chicago. Structural iron makers of Chicago want the headquarters of the proposed national body located at that city.

January Sales.—The following table of weekly sales in January made up from the weekly reports of the Engineering and Mining Journal, will be found useful for reference. Billet sales this year were 6,300 tons below 1895. Bessemer this year exceeds last January 25,675 tons. Gray forge shows an increase of 12,595 tons. The total increase for January was 34,739 tons:

Table with columns: Week ending, Billets, Bessemer, Gray Forge, Total. Rows for Jan 4, 11, 18, 25, 31, and totals for 1895 and 1896.

Late News.—The market closed weak; consumers refuse to pay the rates demanded. Bessemer, \$13@13.25; gray forge, \$11@11.25; billets, \$18@18.25; No. 2 foundry, \$12.25@13.

The 1,700 tons steel rails sunk in the Monongahela River at Braddock, owned by the Carnegie Company has been recovered and will be shipped south on the present rise. The Valley furnacemen are holding out for big figures.

COKE, SMELTED, LAKE AND NATIVE ORE. BLOOMS, BILLETS AND SLABS AT MILL.

Table with columns: Tons, Cash, Tons, Cash. Lists various types of iron and steel products like Bessemer, iron, steel, charcoal with prices.

Philadelphia.

(From Our Special Correspondent.)

Pig Iron.—The sales of foundry and forge iron since Monday have been of sufficient magnitude to harden prices on three or four special brands. The better inquiry all around is lessening the urgency of a few makers of ordinary brands to sell. The idea prevails that iron may improve 25c. Foundry iron is \$13@13.25 for No. 1 and \$12.50@12.75 for No. 2. A good deal of foundry iron work has been uncovered during the past few days. Mill inquiries show that large orders may be placed before long. Buyers are delaying in order to feel a little safer. Brokers say there are a good many mill owners in urgent need of iron. Standard is bringing \$11.50 delivered.

Steel Billets.—The price is not far from \$20. Buyers are watching the market very closely. They are at a loss what to do and hope yet to get in at \$19@19.25. The market is unsettled.

Merchant Bars.—The western competition is making inroads on us, and prices are more irregular, especially on that business which from experience we know is likely to slip through our fingers. Mill quotations are 1.20 and under, store sales 1.40. Manufacturers are all very solicitous to get a few of the big contracts usually let about this time of year.

Nails.—It is quite early to report a firmer market for nails. Inquiries of makers result in showing rather moderate stocks among retailers. Prices are low, but at the asking rates to-day there is no concession.

Skeip.—Grooved is quoted at 1.25 and sheared at 1.35. Very little business was done this week.

Sheet.—Mill men admit that a good deal of business that is usually done at this time of the year is being put off until later, but we may have big sales to record almost any hour.

Wrought Iron Pipes and Tubes.—The early winter orders are all cleaned up, and as manufacturers can make no new inducements, buyers are slow.

Plate and Tank.—The plate mills are perhaps better off than others. There is more or less business coming in all the time. The outside competition is the stone in the mill, or the fly in the ointment. It tones down quotations. Tank and universal plates, 1.45; shell, 1.50; flange, 1.60; fire-box, 1.90.

Structural Material.—Promised business is still in the distance. The unsettled financial conditions connected with the making of the big government loan are given as one reason why a good deal of business has not come in. Angles, 1.40; ties, beams, channels, 1.60.

Steel Rails.—Prospects are fair for the usual early spring orders. Regarding the construction of some of the projected roads, a local rail authority says very much depends on the improvement of traffic and the rates secured.

Old Rails.—Some little business is done at \$14, but mill men believe lower prices will prevail yet when the railroad people start in to relay their iron roads with steel rails, as they intend to do.

METAL MARKET.

NEW YORK, Friday Evening, Feb. 7, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

Table with columns: Feb., St. Ex., London, N. Y. Cts., Value of \$1. in \$1. Lists silver prices for Feb 3, 4, 5, 6, 7.

Silver has been steady at current rates. Exchanges on India are firm, and the tendency has been to sustain the price of silver. There are, however, no new features in the market. Shipment to-day to London were 550,000 oz. The supply continues about at the same ratio, and the demand is fully equal to the supply, so that the market is distinctly firm.

The United States Assay Office in New York reports the total receipts of silver at 87,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States ports, December, 1895, and years 1895 and 1894 in coin and bullion:

Table with columns: Gold, Silver, Total excess, Exp. or Imp. Lists data for Dec, 1895, 1894.

The statements in the table above include only gold and silver in coin and bullion. The exports and imports of gold and silver in ores are reported as below for the year ending December 31st:

Table with columns: 1894, 1895, 1894, 1895. Lists Gold and Silver exports and imports.

Excess, exports, \$713,235; \$1,479,042; \$7,007,584; \$12,241,976. Adding the exports and imports in ores to those in coin and bullion, we have the following statement for the year 1895:

Table with columns: Exports, Imports, Excess. Lists Gold and Silver data.

Totals, 1894.....\$159,167,842 \$58,263,297 E. \$10,904,545

Totals, 1895.....\$149,095,542 \$38,984,201 E. \$110,111,341

This shows an increase in 1895 of \$10,072,300 in exports and of \$19,279,096 in imports, the result being a decrease of \$9,206,796 in the balance exported.

The figures above are furnished by the Bureau of Statistics of the Treasury Department and include all United States ports.

Gold and Silver Exports and Imports, New York

For the week ending February 7th, 1896, and for year from January 1st, 1896, 1895, 1894, 1893 and 1892:

Table with columns: Gold, Silver, Total Excess, Exp. or Imp. Lists weekly and yearly data for New York.

The gold exported for the week went to the West Indies; of the silver \$58,973 went to the West Indies, \$61,693 to South America, and the balance to London. Of the gold imported nearly all came from Great Britain and Germany; the silver was from the West Indies.

FINANCIAL NOTES OF THE WEEK.

The important event of the week has been the public bidding for the 4% bonds offered by the Government, the result of which competition has been very satisfactory, bringing a substantial gain to the Treasury over their last operation of this kind with the Morgan Syndicate. At least 45% of the loan will go direct into the hands of investors, or at all events will be scattered throughout the country to such an extent that it materially raises the knowledge of resource and thereby the credit of the country itself. In banking circles generally there is some little dissatisfaction with the fact that after all the Morgan combination which includes the firm of J. P. Morgan & Company, Harvey Fisk & Company, National City Bank, and the Deutsche Bank of Berlin are likely to receive so large a proportion of the issue, but at the same time other bankers and officials of the government are satisfied that it is for the public good in that the bonds that they will take up will be paid for in gold imported from abroad. There are many sympathizers with the failure of the Stewart bid to reach the necessary price to obtain an allotment, as it is considered that the Stewart bid covering so many banking and financial institutions throughout the country would have been the most advantageous one in the end for the treasurer; of course, always provided that in order to pay for the bonds they did not withdraw gold from the Treasury directly or indirectly.

We learn from the Treasury that the allotment will probably be made to-day, so that the deposits, in accordance with the form of tender, can be made to-morrow, and under which conditions accrued interest will stop from to-morrow. There is now in the Sub-Treasury in New York, and in the Assay Office, about \$20,000,000 in gold under examination, available for the first payment upon this issue, and probably within two days more, from intimations already made to the Sub-Treasury, there will be \$5,000,000 more deposited. Of this amount now in hand very little has been withdrawn from the treasury; so little in fact that it cannot be traced, as if withdrawn it has not been for the purpose of this deposit at a sufficiently recent date to identify it.

From the Assay Office we learn that during the current week, including to-day, there had been deposited \$1,130,000 in British bars, and there have been returned to the assay office previously shipped from New York for export, \$1,662,585 in domestic bars.

Under to-day's date by cable from London, it is announced that £185,000 in gold was withdrawn from the Bank of England for America to-day, but in bars instead of eagles. The bank's price for bars being high, to-morrow's shipments will probably be only £300,000.

The statement of the United States Treasury on Thursday, February 6th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

Table with columns: Jan. 30, Feb. 6, Changes. Lists Gold, Silver, Legal tenders, Treasury notes.

Government deposits with national banks on the same date amounted to \$14,845,076, an increase of \$34,787 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$137,218,280. Against these are held in the Treasury 13,302,928 coined standard silver dollars, and silver bullion purchased at a cost of \$123,915,352, making a total of \$137,218,280.

The statement of the New York banks—including the 63 banks represented in the Clearing House—for the week ending February 1st, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

Table with columns: 1894, 1895, 1896. Lists Loans and discounts, Deposits, Circulation, Specie, Legal tenders.

Total reserve... \$249,575,100 \$173,492,800 \$162,235,200

Legal requirement... 137,952,100 136,741,300 122,611,800

Surplus reserve... \$111,623,000 \$36,751,500 \$39,623,400

Changes for the week this year were increases of \$685,000 in specie; \$1,436,500 in legal tenders; \$1,944,900 in surplus reserve, and \$706,400 in deposits; decreases of \$717,200 in loans, and \$11,500 in circulation.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced



Liverpool.

Jan. 29.

(Special Correspondence of Joseph P. Brunner & Co.) In the general lines of heavy chemicals, there is practically nothing new in the position. The sulphate of copper manufacturers have formed a combination and put up prices 10s. a ton, to £16 f. o. b. here, and a further advance is considered not unlikely. Soda ash is inactive and orders scarce. Quotations are without change, the nearest spot range for tierces being about: Leblanc ash, 45%, £4 @ £4 5s.; 58%, £4 5s. @ £4 10s. per ton. Ammonia ash, 48%, £3 7s. 6d. @ £3 12s. 6d.; 58%, £3 12s. 6d. @ £3 15s. per ton, net cash. Bags, 5s. under price for tierces. Soda crystals are in retail demand at £2 7s. 6d. @ £2 10s. per ton, less 5% for barrels, and 7s. less for bags.

Caustic soda is still scarce and prices firm. We quote spot range, according to export market, as follows: 60%, £8 5s. @ £8 12s. 6d.; 70%, £7 5s. @ £7 12s. 6d.; 74%, £8 5s. @ £8 10s.; 76%, £9 5s. @ £9 10s., all per ton, net cash.

Beaching powder is in limited request and dull, but quotations are unchanged, ranging from £7 5s. @ £7 10s. per ton, net cash, for hard wood packages, according to destination. Chlorate of potash is quoted at 4 3/4d. per lb., but there is little business passing, the demand being disappointing.

Bicarb soda is selling in a moderate way, at £6 15s. per ton, less 2 1/2%, for the finest quality, in 1 cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia still drags, and £8 12s. 6d. @ £8 15s. per ton, less 2 1/2%, may be called about nearest values for good gray, 24 and 25%, in double bags f. o. b. here, according to quality. Nitrate of soda is about 5s. dearer for cargoes to arrive, owing to reported combination arrangement, while on the spot £3 per ton, less 2 1/2%, is lowest for double bags f. o. b. here. Carb. ammonia, lump, 3 1/4d. per lb.; powdered, 3 1/4d. per lb., less 2 1/2%.

MINING STOCKS.

Complete quotations will be found on pages 150 and 151 of mining stocks listed and dealt in at:

Table listing mining stocks with columns for location (New York, Boston, Philadelphia, Baltimore, Pittsburgh, Denver, Colo., Aspen, Colo., Colorado Springs, Duluth, Minn., Helena, Mont., Salt Lake, Utah, San Francisco, St. Louis, Paris, France, Mexico, Shanghai, China, Valparaiso, Chile, London, England).

NEW YORK, Friday Evening, Feb. 7.

There has been a slight improvement in the demand for mining stocks here. Brokers report that their customers are taking greater interest in this form of investment, and while actual buying orders have not been sent in to any great extent, yet indications point to a revival of activity in this line.

The Comstocks were dull as usual; sales were as follows: 100 shares Best & Belcher, at 82c.; 300 shares of Comstock Tunnel at 8c.; 500 shares of Consolidated Imperial at 4c.

Colorado stocks continue to be the favorites with the public. The demand for them is not confined altogether to the Cripple Creek stocks, for Leadville Consolidated was in some demand, and prices advanced from 12 @ 17c., with sales of 5,100 shares. Of other Leadville stocks there were sales of 100 shares of Chrysolite at 20c., and 1,400 shares of Small Hopes at 8 1/2 @ 8 7/8c.

Golden Fleece was stationary at \$1.70, and total sales of 2,700 shares are reported.

Sales of the Cripple Creek stocks were as follows: 1,100 shares of Creede & Cripple Creek at 8c.; 8,300 shares of Croesus at 4 @ 5c.; 500 shares of Favorite at 11c.; 900 shares of Isabella at 52 @ 53c.; 500 shares of Mount Rosa at 17c.; 1,800 shares of Pharmacist at 17 @ 18c.; and 1,850 shares of Victor at 5 1/2 @ 5 3/4, and 500 shares of Work at 20c.

Of the California stocks Standard Consolidated advanced from \$1.90 to \$2, with sales of 400 shares. Other sales were 500 shares of Bulwer at 12 @ 14c. 80 shares of Brunswick at 8 @ 9c.

There was a sale of 200 shares of Phoenix at 8c.

Boise, Ida.

Jan. 31.

(From Our Special Correspondent.)

It may now be said that the Idaho Mining Exchange is fully organized. A meeting of the subscribers was held last week at which 100 persons were present. Your readers are aware of the purposes of the exchange, as a report of it appeared in the Engineering and Mining Journal of January 4th. At last week's meeting the articles of incorporation were agreed upon, constitution and by-laws were adopted and a board of directors was elected, consisting of J. H. Hawley, Fremont Wood, Frank Coffin, David Falk, D. M. Steen, K. P. Plowman, Capt. John W. Plummer, O. E. Jackson, J. M. Haines, H. W. Dorman and Frank D. Howe. The president will duty appoint committees to overlook the various departments. The constitution gives the following as the duties of what is perhaps the most important committee of the exchange: "It shall be the duty of the committee on development, information and advertising to collect all information possible in regard to the mining resources of the different sections of this State; to file such information with the secretary, in tabulated form; to make rules in regard to caring for and preserving specimens and cabinets owned by, or in possession of the association, to attend to all matters connected with advertising the mining resources of the State; to make rules for the guidance of persons desiring assistance in developing prospects and mining properties, and of persons desirous of aiding therein. Such committee shall have authority to post lists of prospects and persons owning them, when as-

istance is desired for developing them, and furnish all information they may have in regard thereto, to any member or other responsible person requesting it.

The character of the men who are interested in the Exchange is a guarantee of honest methods. The nature of the work which the Idaho Mining Exchange proposes to carry out can not fail to be of great benefit to the entire State, and I can conscientiously recommend Eastern investors to turn their eyes in our direction. None is obliged to invest his money among us. All that is desired is to bring to the notice of the public throughout the United States the possibilities offered by our mineral resources, which are by no means as well known as they deserve. Facilities for trading in mining stocks will be afforded to all, and the listing committee will exercise due caution concerning the companies which will be placed on the list of the Exchange.

Boston.

Feb. 6.

(From Our Special Correspondent.)

The feature of the market the past week was the decline in Butte & Boston from \$13 1/4 to \$8 per share on reports that the company had been compelled by injunction to abandon work on the territory claimed by the Anaconda Company, and consequently its production would be reduced one-half. It is also evident that there has been a persistent effort on the part of interested parties to antagonize the stock and keep the price down until the shares belonging to the Davis estate had been distributed. There have also been all sorts of rumors regarding the condition of the company financially, but as they have never made any reports to the stockholders it is impossible to get at the exact truth of the matter. There has been a good deal of stock thrown on the market, and at the decline it will find ready purchasers. It rallied up to \$9 to-day and closed at \$8 3/4. Boston & Montana was unfavorably affected by the decline in Butte, and touched \$7 1/2, but it has rallied sharply, and sold at \$7 7/8 to-day, losing about \$1 in the final dealings. These two stocks have absorbed the interest in the market, as very little has been done in the balance of the list.

The Lake stocks have shown a good degree of strength without much advance in prices. Calumet & Hecla sold up to \$305 on the announcement of a \$5 dividend, making \$25 for the last twelve months. Quiver was steady at \$123 and Tamarack sold up to \$117 1/2, but lost it in the later dealings. O-cocla gained \$1 and sold at \$27 1/2, losing the fraction only. Franklin was quoted early at \$1 1/4, but later sales were at \$1 3/4. A Lintic was strong and advanced \$1 to \$17 1/2. Kearsarge sold up to \$13 1/2, back to \$12 1/2, and recovered to \$13. Tamarack, Jr., sold at \$7 1/2, declined to \$15 1/2 and recovered to \$16 1/2. Wolverine touched \$7 and held quite firmly. Tecumseh gained \$1 1/4 to \$3 1/4 and closed at \$3. Old Dominion advanced to \$19, a gain of \$1 for the week. Arncld was firm at \$1 1/2.

In gold stocks Santa Ysabel scored an advance from \$10 1/2 to \$13 1/4 losing the fraction. Merced sold at \$31 1/2, declined to \$31 and recovered to \$33. Pioneer advanced 1/2 to \$4 1/2. Gold Coin sold at \$1, with later sales at 95c. Boston & Cripple Creek sold at 40c.

Chicago.

Feb. 6.

The bid prices and transactions recorded on the Chicago Mineral and Mining Board for the week ending February 4th were:

Table listing mining stocks with columns for Name, 29, 30, 31, 1, 3, 4, Sales. Includes stocks like Anaconda, Annapolis, Acheria Leland, Bankers, Bob Lee, Boston-Croco, Denver, Delaware Chief, Favorite, Finance, Golden Fleece, Gottlieb, Henrietta, Iron Mountain, Isabella, Jefferson, Justice, Lincoln Boy, Moline Gibson, Pharmacist, Portland, Rhyolite, Royal Age, Sleepy Hollow, Squaw Mountain, Stockholm, Union Gold.

Total shares sold, 512,500.

Colorado Springs, Colo.

Feb. 1.

(From Our Special Correspondent.)

During the past week trading in mining stocks, though fairly active, was not altogether satisfactory as to prices. There have been declines in values, especially in some of the lower priced shares, which were probably due to the fact that speculators, who had bought cheaply, sold on the recent advance.

The belief is growing that the Board of Trade did a wise thing in uniting with the Consolidated. Already the volume of business is greater at each of the two existing exchanges. The example of Denver in starting several exchanges there where one was ample, is not regarded as worthy of emulation. The Colorado Springs Mining Stock Exchange, as the natural result of the recent addition of 25 new members, is experiencing more activity.

The weakness which to some extent characterized the market at the close of the week is prob-

ably only temporary, though it is too much to expect an advance all along the line next week.

BY TELEGRAPH.

Messrs. Gardner & Co. wire us the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending February 6th, as follows:

Table listing mining stocks with columns for Name of Company, 31, 1, 3, 4, 5, 6. Includes stocks like Alamo, Anaconda, Arcentum-Junlata, Blue Bell, Cripple Creek Con., Golden Fleece, Isabella, Moline Gibson, Mount Rosa, Pharmacist, Portland, Silver State, Union, Work.

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

Table listing mining stocks with columns for Name, 31, 1, 3, 4, 5, 6. Includes stocks like Bankers, Des Moines, Gold & Globe, Gold Standard, Isabella, Jefferson, Keystone.

Cleveland, O.

Feb. 6.

(From Our Special Correspondent.)

Transactions and interest in the iron ore stocks this week have been pretty much crowded aside by the gold bond bids. The money locked up to meet possible payment on these bids has had a depressing effect upon stock trading generally, and the iron ore properties have felt it. The holders of iron ore stocks, moreover, seem to attach greater values to them than buyers are willing to acknowledge.

Following are quotations of current prices:

Table listing mining stocks with columns for Name of Company, Par val., Feb. 6. Bid., Ask. Includes stocks like Aurora, Chandler, Cleveland-Cliffs Iron Co., Jackson Iron Co., Lake Superior Iron Co., Lake Superior Consolidated, Minnesota Iron Co., Pitsburg & Lake Anzeline, Republic Iron Co.

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

Table listing coinage with columns for Denominations, Pieces, Value. Includes Double eagles, Half eagles, Quarter eagles, Total gold, Quarter dollars, Total silver, Five cents, One cent, Total minor, Total coinage.

Laramie, Wyo.

Jan. 30.

(From Our Special Correspondent.)

The Laramie Mining and Stock Exchange is no longer a possibility, but an accomplished fact. At a meeting held last Thursday the members elected officers as follows: M. N. Grant, president; A. Trabing, vice-president, and C. E. Denig, secretary. The Exchange starts out with 47 paid-up members, whose personal character and enthusiasm augur well for the success of the Exchange.

Among other things, it was decided to reconsider the motion by which the constitution was adopted at the previous meeting and the board of trustees is now at work upon a suitable constitution and by-laws. The membership list was left open until February 1st.

The members of this Exchange will not only deal in mining stocks, but will also take measures looking to the development of the mineral wealth of Wyoming. Publicity is needed and the Laramie Exchange will endeavor to interest local and Eastern investors in mines in this State by gathering and publishing full information concerning them.

Salt Lake City, Utah.

Feb. 1.

(Special Report of James A. Pollock.)

The past week in local mining stock circles was about a repetition of that of the previous same period, outside orders being about evenly divided with the local.

Ajax did little business. Alliance was inactive. Gas had a lower tendency. Anchor is more in demand than during the previous week.

Bogan was not in very heavy demand. Bullion-Beck was wanted, but not at the holding price. It is possible that the company will pay an increased dividend next month. Centennial-Eureka continues to gain strength, and a number of buyers were in the field at last week's quotations, at which some

considerable business was done. The usual extra double dividend of \$1 per share will come to the stockholders on the first. This will make \$2 per share for the month, or \$60,000.

Dalton did not show any particular strength. The annual meeting was held on the 31st and some changes were made in the directory, and the reports submitted were all of a satisfactory nature.

Mammoth showed more strength than during the previous week, considerable business being done in the stock. Development work and ore extraction continues as heavy as ever.

Ontario came in for its share of attention, and bids of \$9.75 per share failed to bring out any of the stock. The company paid a dividend on the 31st of 10c. per share, or \$15,000.

San Francisco. Feb. 1. (From our Special Correspondent.)

The market has been a very dull one this week. It opened very quietly on Monday, and no improvement could be noticed at any time.

At the close Consolidated California & Virginia is quoted \$2.35@2.40; Ophir, \$1.35@1.40; Hale & Norcross, \$1.20@1.25; Occidental \$1@1.05; Confidence, \$1@1.05.

There was some dealing in the Bodies in a small way. Bodie Consolidated was quoted 33@40c.; Bulwer, 12@14c.; Mono, 15@16c.

The Andes Mining Company has levied an assessment of 15c. per share, delinquent March 6th.

The Silver King Mining Company, of Arizona, has levied an assessment of 25c. per share, delinquent March 9th.

The San Francisco Stock and Exchange Board has listed the shares of the Mayflower Gravel Mining Company and added those of the Eureka Drift Mining Company to its list.

THE NEW EXCHANGE.

At a meeting of the Gold Mining Exchange of San Francisco, held January 29th, President Turnbull announced the appointment of the following committee: Executive Committee: P. T. Dickinson, chairman; W. R. Smedberg, C. L. Hovey, Louis Glass, J. H. Roberts.

The committees are hard at work formulating plans of action and preparing circulars of information which will soon be issued. Workmen are busy fitting up the offices and rooms of the Exchange in a substantial manner and it is expected they will be ready for business about the middle of February.

London. Jan. 25. (From Our Special Correspondent.)

The past week has been a very quiet one on the Stock Exchange. The hesitation in the South African section has continued, as was to be expected, and in the absence of genuine business prices are only sustained by the buying back by bears.

by speculators for their own ends. Rumors are floated round to the effect that some of the largest gold producers are shut down entirely owing to the absence of labor, but I have received information from parties on whom I can rely that such reports are quite untrue.

This week, however, things have not been brisk in West Australia, and the market has lapsed into comparative dullness again. Quite 200 jobbers who used to make South Africa their specialty have migrated to the West Australian section.

The Indian section has been dull, but more interest is being taken in New Zealand mines. Broken Hill Proprietary has been strong all the week on Colonial buying, and the shares now stand at £3.

The American section is lifeless, and the expected boom may now be declared "off." The Exploration Company from which we hoped so much has given up all idea of opening up schemes for promoting American mines.

A company has been formed privately, called the General Banking and Mining Corporation, Limited, with a capital of £500,000. Nearly the whole of the subscribers are Frenchmen, or more specifically, Parisians, and a few English directors have been nominated, more for form's sake than anything else.

Paris. Jan. 25. (From Our Special Correspondent.)

Our stock market is steadier and business in general better than for some weeks past. Really there is not very much reason for it, except that we have grown to be so much accustomed to unfavorable political rumors that we no longer regard them.

There has been quite a revival of interest in the metallurgic stocks, and the prices of most of them are improving. The Crenset and several other large establishments report a better business, especially in marine work, and the amount of product is improving, in spite of the fact that railroad orders have been unusually light.

The lead stocks have been generally improving in price. The shares of the zinc companies are weak, the continued large production and active competition having an unfavorable effect.

The copper stocks all show increases in quotations, based in part on the small improvement in prices of the metal, but chiefly on reports of limited production on your side. How true these may be I do not know, but imports from America seem to continue large.

Nickel shares continue to hold a large part of the recent advance, and this week the price has risen a little, though on very small sales.

There has been quite an active movement in Huanchaca (silver) shares, and there are reports of a movement to effect a change in the management.

The preliminary statement of the Paris Mint for last year shows that in 1895 there were coined in

all 54,300,000 pieces, of a face value of 158,100,000 fr. The weight of the coins was in round numbers 351,300 kilos. The French coins represented in value 116,000,000 francs, of which 103,000,000 fr. were gold and 8,000,000 francs silver and bronze subsidiary coins. The remaining 42,100,000 fr. were in colonial and foreign coins.

We are all watching with a good deal of interest the result of your new bond issue. There is much discussion as to the amount of gold which it will draw out, and the disposition of your investors to support the Treasury. Some doubt is felt as to the outcome, but the more general belief is that the issue will succeed.

MEETINGS.

Table with columns: Name of Co., Location of office, Date, Time. Includes entries for Ader Bell, Bushwhacker, Caledonia, Elda, Equitable, Holmes, Illinois Steel, Mt. Powell, New Park, N. Y. & Tex Gold, Port Henry, Iron Ore, Uncle Sam, Watt Blue.

ASSESSMENTS.

Table with columns: Name of Co., Loc'n., No., Dinq., Sale, Amt. Includes entries for Alta, Anchor Coal, Andes, Channel Bend, Crown Point, Florence G. & S., Good Hope, Gray Eagle, Granite Hill, Hite, Jenny Lind, Julia Con., Justice, Kimberly G. & S., Lady Wash. Con., Minnie Quartz, New Basil Con., Occidental Con., Orleans, Raleigh, Savage, Shasta, Silver King, Trinity Con., Ybarra.

DIVIDENDS.

Table with columns: NAME OF COMPANY, Paid in January, Current Dividends Payable, Total since Jan. 1, 1896. Includes entries for Alaska-Mexican, Alaska-Treadwell, Belden, F. E., Boston & Mont., Bullion-Beck & Ch., Calumet & Hecla, Centennial-Eureka, Diamond Coal, Gold Coin, Golden Fleece, Gold & Globe Hill, Highland, Homestake, Horn Silver, Isabella, Isabella, Marcur, Moose, Napa Con., Ontario, Osceola Con., Parland, Quincy, Silver King, Snuggler-Union, Utah, Victor, Victor L. & M., Totals.

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 of stock quotations for Boston, Mass. listing companies like Alcoa, Amoskeag, and others with columns for location, par value, and daily price movements.

\* Official quotations Boston Stock Exchange. Total sales, 93,265.

INDUSTRIAL COAL AND COAL RAILROAD.\*

Table of industrial coal and coal railroad stock quotations, including companies like Baltimore & Ohio, Col. Fuel & I., and others.

\* Official quotations N. Y. Stock Exchange. Total shares sold, 23,566.

NEW YORK.\*

Table of stock quotations for New York, listing companies like Alamo, Anaconda, and others with columns for location, par value, and daily price movements.

\* Official quotations N. Y. Stock and Con. Stock & Petroleum Exchanges. Total sales, 25,560.

PITTSBURG, PA.\*

Week ending Feb. 6.

Table of stock quotations for Pittsburgh, Pa., including coal and gas companies like Mansfield, N.Y. & C. Gas Co., and others.

\* Official quotations Pittsburgh Stock Exchange.

COLORADO SPRINGS, COLO.\*

Table of stock quotations for Colorado Springs, Colo., listing companies like Ajax, Alamo, and others with columns for par value and daily price movements.

\* Official quotations and sales Board of Trade Exchange. † Mining Stock Association.

ST. LOUIS, MO., STOCKS.

Week ending Feb. 4.

Table of stock quotations for St. Louis, Mo., listing companies like Central Lead, Doe Run Lead, and others.

SAN FRANCISCO, CAL.\*

Table of stock quotations for San Francisco, Cal., listing companies like Alta, Becher, and others.

† Official telegraphic quotations San Francisco Stock Exchange.

BALTIMORE, MD.\*

Week ending Feb. 6.

Table of stock quotations for Baltimore, Md., listing companies like Balt. M. & S. N. C., Conrad Hill, and others.

\* Official quotations Baltimore Stock Exchange.

MISCELLANEOUS SECURITIES.

Table of miscellaneous securities including American Coal, Chateaugay Ore & Iron R. R., and others.

LONDON. Jan. 24.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations (Buyers, Sellers), and Prices.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par value, Jan. 27, Jan. 28, Jan. 29, Jan. 30, Jan. 31, Feb. 1, and Sales.

PARIS. Week ending Jan. 23.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Op'ning, and Closing.

All the companies are located in Colorado. Total shares sold, 2,038,500.

PHILADELPHIA, PA.

Table with columns: NAME OF COMPANY, Location, Par value, Jan. 30, Jan. 31, Feb. 1, Feb. 3, Feb. 4, Feb. 5, and Sales.

Official quotations Philadelphia Stock Exchange. Total sales, 8,546.

MEXICO. Week ending Jan. 30.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Opening, and Closing.

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.

VALPARAISO, CHILE. Week ending Dec. 21.

Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Bid, Asked, Last sale.

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

SHANGHAI, CHINA. Jan. 3.

Table with columns: NAME OF COMPANY, Country, No. of shares, Par value, Last dividend, and Price.

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

SALT LAKE CITY, UTAH. Week ending Feb. 1.

Table with columns: Name of Company, Par value, Bid, Asked, Actual selling price, Name of Company, Par value, Bid, Asked, Actual selling price.

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

ASPEN, COLO. Week ending Jan. 29.

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Sales, Price.

Special Report of J. F. MacMillan. Total sales, 110,800.

HELENA, MONT. Week ending Jan. 28.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares, Price, Date.

Special Report of Samuel K. Davis. Total shares sold, 9,369.

DULUTH, MINN. Week ending Feb. 1.

Table with columns: NAME OF COMPANY, Location, Company's Office, Par value, Bid, Ask, Price.

Official quotations Duluth Board of Trade.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

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

G. Gold, S. Silver, L. Lead, C. Copper, B. Borax. \* Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Colorado Virginia \$42,390,000. ‡ Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. § Previous to this company's acquiring Northern Belle, that mine paid \$400,000 in dividends against \$425,000 in assessments.



CLASSIFIED LIST OF ADVERTISERS.

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Bostelmann, Louis F. | Leyner, J. Geo.  
Bullock, M. C. Mfg. Co. | Marvin Elec. Drill Co  
Burlish Rock Drill Co | McKiernan Drill Co  
Clayton Air Compressor Works. | Norwalk Ir. Wks Co  
Fraser & Chalmers. | Philadelphia Eng.  
Gates Iron Works. | Wks., Ltd.  
Ingersoll-Sergeant | Rand Drill Co.  
Drill Co. (See Diamond Drills)

**Aluminum Bronze**  
Fairbanks Co.

**Amalgamators**  
Bucyrus Steam Shovel & Dredge Co.  
Fraser & Chalmers.  
Gates Iron Works.

**Amalgam Flasks.**  
Western Flaming and Mfg. Co.

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

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Berlin Iron Bridge Co.  
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Pollock, Wm. B. & Co.

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Answorth, Wm. | Penn Sm. & Ref. Wks.  
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Baker & Co. | Roessler & Hasslach  
Becker, Christian. | Chemical Co.  
Bullock & Crenshaw. | Solvay Process Co.  
Denver Fire Clay Co. | Taylor, John, & Co.  
Elmer & Amend. | Troemner, Henry.  
Gates Iron Works. | Western Chemical Co.  
Henry Hill Chem. Co.  
**Attorneys, Corporation**  
Emig, C. E.  
Jones & Rhett.  
McIndoe, H.

**Automatic Boiler Feeds**  
D'Eate & Seelye.

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

**Bankers and Brokers**  
Carnbright, W. P., & Co. | Lindley & Fitzpatrick.  
Carnuff, A. & Co. | McCoy & Hotelahan.  
Crandel & Huff. | Miller, W., & Co.  
Decker, L. H. | Morath Investm't Co.  
Dorsey, H. H. | Parsons & Gandy.  
Doubleday, Kope & Co. | Peek, Frank G.  
Edsall, Clarence & Co. | Prentice, Russell.  
Fall, Brooks & Cramer. | Prouditt, J. W., & Co.  
Farnsworth, C. S., & Co. | Reed Bros.  
Fletcher, C. S., & Co. | Shelden, E. C.  
Gardner & Co. | Sill & Sill.  
Grant, E. H. | Smith, C. H.  
Handy & Harman. | Snow, E. P.  
Harrilt, W. M. | State Trust Co.  
Hendrickson, W. J. | Van Deussen & Water  
Hodgins, L. W. | man.  
Hicks & Benzie. | Wandell, H. V.  
Kennrick, W. F. | Weigand Bros.  
Kinney, M. F. | White, Fred B.  
Kjellander, C. F. & Co. | White, Samuel.  
Lantz, John S. | Williamson, W. W.

**Belting**  
Carp'ter, Geo. B. & Co. | Link Belt Machinery  
Hendrie & Bolthoff | Co.  
Lippelmer, N. | New York Belting &  
Miller, Chas. N. & Co. | Packing Co., Ltd.  
Mayer, Andrew.

**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. | Pollock, Wm. B. & Co.  
Enterprise Boiler Co. | Risdon Iron Works.  
Fraser & Chalmers. | Scaife, Wm. B. & Sons.  
Gates Iron Works. | Stillwell-Bierce &  
Philadelphia Eng. | Smith-Valle Co.  
Wks., Ltd. (See Machinery.)

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

**Brewers.**  
Fahst Brewing Co.

**Brick Machinery**  
Frees, E. M., & Co.

**Bridges**  
Berlin Bridge Co. | Scaife, Wm. B. & Sons.  
Pittsburg Bridge Co. | Shiffer Bridge Co.

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

**Carbons**  
Bishop, Victor, & Co.  
Bostelmann, Louis F.  
Lexow, Theodore.

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

**Chemicals**  
Baker & Adamson. | Roessler & Hasslach  
Bullock & Crenshaw. | Chemical Co.  
Elmer & Amend. | Solvay Process Co.  
Henry Hill Chem. Co. | Western Chemical Co.  
Coal | Maryland Coal Co.  
Herwind-White Coal | Potts, F. A., & Co.  
Mfg. Co. | stickney, Conyngham  
Consolidation Coal Co. | & Co.  
Coal Cutters | Ward & Olyphant.  
Ingersoll-Sergeant Drill Co. |  
Jeffrey Mfg. Co. |  
Leyner, J. Geo. (See Machinery.)  
Link Belt Machinery Co.

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

**Concentrators, Crushers, Pulverizers, Separators, Etc.**  
Allis, Ed. P. & Co.  
Beckett Foundry & Machine Co.  
Blake, Theo. A.  
Boston Ore Machinery Co.  
Bradley Pulverizer Co.  
Colorado Iron Works.  
Denver Eng. Works Co.  
Engelbach Mach. Mfg. Co.  
Fraser & Chalmers.  
Frost Vanner Concentrator.  
Gates Iron Works.  
Hendrie & Bolthoff Mfg. Co.  
Krupp, F.  
Link Belt Machinery Co.  
McCully, R.  
Scienville, H. H., & Co.  
Stedman Foundry & Mach. Co.  
Walburn-Swenson Mfg. Co. (See Machinery)  
Contractors (See Machinery.)

**Copper Dealers and Producers.**  
American Metal Co. | James & Shakspeare.  
Arizona Copper Co. | Kearsarge Mg. Co.  
Atlantic Mining Co. | Lambert's Wharf. Co.  
Balbach S. & Ref. Co. | Lewisohn Bros.  
Baltimore Cop. Wks. | Orford Copper Co.  
Bath, H., & Son. | Osceola Con. Mg. Co.  
Boston & Mont. M. Co. | Pass, C., & Son, Ltd.

**Bridgeport Copper Co.**  
Butte & Boston M. Co.  
Canada Copper Co.  
Copper Queen Mg. Co.  
Detroit Conr. Mg. Co.  
Elliott's Metal Co., Ltd.  
**Corrugated Iron.**  
Berlin Iron Bridge Co.  
Scaife, W. B. & Sons  
**Crucibles, Graphite, Etc.**  
Denver Fire Clay Co.  
Dixon, Jos. Crucible Co.  
**Damper Regulators**  
D'Eate & Seelye.

**Cyanide.**  
Roessler & Hasslach Chemical Co.

**Diamonds**  
Bishop, Victor, & Co.  
Bostelmann, L. F.  
Lexow, Theodore.  
**Diamond Drills**  
Bishop, Victor, & Co.  
Bostelmann, L. F.  
Brook Mfg. Co., M.C.  
Lexow, Theodore.  
Sullivan Mach'ry Co.  
(See Air Compressors and Rock Drills.)

**Draughtmen.**  
Young, Wm. R.

**Drawing Materials.**  
Besley, Chas. H., & Co. | Heer, Peter  
Dietzen, E. & Co. | Mann & Co.  
(See Engineering Instruments.)

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

**Dryers.**  
Brown, Horace T. | Davis Colby Ore  
Cummer, F. D. & Son Co. | Roaster Co.  
Denver Eng. Wks. Co.  
**Dump Car.**  
Denver Eng. Works Co. | Hunt Co., C. W.  
Gates Iron Works. | Fraser & Chalmers.  
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.

**Electrical Batteries**  
Macheth, James, & Co.

**Electrical Machinery and Supplies**  
Besley, Chas. H., & Co. | Link Belt Mach. Co.  
Card Electric Co. | Okonite Co., Ltd.  
Denver Eng. Wks. Co. | Repauno Chem. Co.  
Gates Iron Works. | Stiles, Geo.  
General Electric Co. | Walker Mfg. Co.  
Jeffrey Mfg. Co.

**Elevators, Conveyors and Hoisting Machines**  
Brown Holist & Conv. | Gates Iron Works.  
Mach. Co. | Fraser & Chalmers.  
Caldwell, H. W., & Co. | Hunt, C. W., Co.  
California Wire Wks. | Joplin Machine Works  
Cooper, Hewitt & Co. | Link Belt Mach. Co.  
Crook, W. A., & Bros. Co. | Marvin Elec. Drill Co.  
Denver Eng. Wks. Co. | Scaife, Wm. B., & Sons.  
Field & Goetzman. | Vulcan Iron Works.  
(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. | Heer, Peter.  
Bullock & Crenshaw. | Mann & Co.  
Dietzen, F., & Co. | Seelig & Kandler.  
Fauth & Co. | Umach, T. F.  
**Engines**  
Buckeye Engine Co. | Risdon Iron Works.  
Bullock, M. C. Mfg. Co. | Racine Hardware Co.  
Dayton Gas Engine & Mfg. Co. | Stillwell, Bierce &  
Mfg. Co. | Smith-Valle Co.  
Enterprise Boiler Co. | Tod, William & Co.  
Ellison, Wm., & Son. | Union Iron Works.  
Fraser & Chalmers. | Webster, Camp & Lane  
Lidgerwood Mg. Co. | Mach. Co.  
(See Machinery.)  
Philadelphia Eng. Wks., Ltd.

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

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

**Furnaces**  
Brown, Horace. | Moore, S. L., & Son Co.  
Gates Iron Works. | Pollock, W. B. & Co.  
Hoskins, Wm. | Sheffield Car Co.  
(See Machinery.)

**Fuses, Powder**  
Ingersoll-Sergeant Drill Co.

**Fuse, Safety.**  
Climax Fuse Co.

**Gas Engines.**  
Dayton Gas Engine & Mfg. Co.

**Gas Works**  
Pollock, Wm. B. & Co.  
Wood, R. S., & Co.

**Gauges, Recording, Etc.**  
Bristol Mfg. Co.

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

**Grease, Graphite, Etc.**  
Besley, Chas. H., & Co. | Dixon, Jos., Cruc. Co.  
**Harveyed Steel.**  
Pierce & Miller Engineering Co.

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

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

**Injectors.**  
Fenberthy 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.  
Buckley, J. & Mch. Co.  
Besley, Chas. H., & Co.  
Blake, T. A.  
Bostelmann, L. F.  
Boston Ore Mach'ry Co.  
Bradley Pulverizer Co.  
Buckeye Engine Co.  
Bullock, W. C. Mfg. Co.  
Caldwell, H. W., & Co.  
Card Electric Co.  
Carp'ter, Geo. B. & Co.  
Chanuon, H. Co.  
Colorado Iron Works.  
Connorsville Blower Co.  
Crook, W. A. & Bros. Co.  
Davis Colby Ore & Co.  
Denver Eng. Wks. Co.  
Ellison, Wm., & Son.  
Engelbach Ma. Mfg. Co.  
Field & Goetzman.  
Fraser & Chalmers.  
Gates Iron Works.  
Hammond, Mfg. Co.  
Hendrie & Bolthoff Mfg. Co.  
Ingersoll-Sergeant Drill Co.

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

**Metal Dealers**  
American Metal Co.  
Am. Zinc-Lead Co.  
Baker & Co.  
Bath, 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.

**Metallurgical Works and Ore Purchasers' Processes**  
Amer. Zinc Lead Co. | Matthiessen & Hegeler  
Baker & Co. | Co.  
Balbach S. & Ref. Co. | John Machine Wks.  
Baltimore Copper Wks. | Kan. City S. & Ref. Co.  
Bridgeport Copper Co. | Ledoux & Co.  
Canadian Copper Co. | Newark Pulv'ng Wks.  
Denver Eng. Wks. Co. | Orford Copper Co.  
Elliott's Metal Co., Ltd. | Penn'y. Salt Mfg. Co.  
Foster, Blackett & Wilson. | Ricketts & Banks.  
Fraser & Chalmers. | Russell Process Co.  
Gates Iron Works. | State Ore Sampling Co.  
W. A. B. n-Swenson Mfg. Co.

**Mine Cars**  
Denver Eng. Wks. Co.  
Gates Iron Works.  
Hendrie & Bolthoff Mfg. Co.  
Hunt, C. W., Co. | Sheffield Car Co.  
Sheffield Car Co. | (See Machinery.)  
Mine, Mill and Smelters Supplies.  
Carpenter, Geo. B. & Co.  
Denver Eng. Wks. Co.  
Gates Iron Works.  
Park's & Wilkinson.  
Roessler & Hasslach Chemical Co. |  
(See Machinery.)

**Mining and Land Companies**  
Atlantic Mg. Co. | Detroit Copper Mg. Co.  
Arizona Copper Co. | Eureka Co.  
Boston & Mont. Mg. Co. | Kearsarge Mg. Co.  
Butte & Boston Mg. Co. | Osceola Con. Mg. Co.  
Clark Land & Mines Co. | Tamarack Mg. Co.  
Copper Queen Mg. Co. | Tamarack, Jr., Mg. Co.

**Nickel**  
Canadian Copper Co.

**Ore Roasters**  
Brown, Horace F.  
Cummer, F. D. & Sons Co.  
Davis-Colby Ore Roaster Co.

**Ore Testing Works**  
Hunt & Robertson.  
Ledoux & Co. | Ricketts & Bank a.  
State Ore Sampling Co.

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

**Perforated Metals**  
Aitchison, R., Perf. Metal Co.  
Fraser & Chalmers.  
Harrington & King Perforating Co.

**Phosphor-Bronze**  
Phosphor-Bronze Smelting Co.

**Pile Drivers**  
Bucyrus Steam Shovel and Dredge Co.  
Ingersoll-Sergeant Drill Co.

**Pipes**  
Pollock, Wm. B., & Co. | Wyckoff, A., & Sons,  
Johnson, Matthey & Co.

**Platinum**  
Baker & Co.  
Johnson, Matthey & Co.

**Powder**  
Atlantic Dynamite Co. | Lafin & Hand Pow-  
Atna Powder Co. | der Co.  
Ingersoll-Sergeant Drill Co. | Lau, J. H., & Co.  
Drill Co. | Repauno Chem. Co.

**Pressure Blowers**  
Connorsville Blower Co.

**Pressure Regulators**  
D'Eate & Seelye. (Curtis.)

**Publications**  
I'n & C. Trade Review  
Australasian Mg. Stand. | Lixivation of Silver  
Ores.  
Bullionist. | McNeill's Code  
Colliery Guardian. | Mining Journal.  
Denver Republican. | Poo's Manual of R.R.'s  
Economic Mining. | Scientific Pub. Co.  
El Minerio Mexicano. | So. African Mg. Jour.  
Electrical Plant & | Spon & Chamberlain.  
Financial Times. | Stetefeldt, C. A.  
Indian Engineer. | Zeitschrift fur Prac-  
tische Geologie.

**Pumps**  
Baker, Geo. F. Mfg. Co. | Hooker Steam Pump  
Cameron, A. S., steam | Works.  
Pump Works. | Jeaneville Iron &  
Denver Eng. Wks. Co. | cusometer Steam  
Fraser & Chalmers. | Pump Co.  
Gates Iron Works. | Stillwell-Bierce &  
Goldis Mfg. Co. | Smith-Valle Co.  
Tod, Wm., & Co.  
Worthington, Henry

**Quarrying Machines**  
Bostelmann, L. F.  
Gates Iron Works.  
Ingersoll-Sergeant Drill Co.  
Rand Drill Co.  
Sullivan Machinery Co.  
Eureka 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. B. & Co. | Hunt, C. W. Co.  
Chanuon, B. Co. | Porter, H. K., & Co.  
Fairbanks Co. | Robinson & Orr.  
(See Machinery.)

**Regulators, Damper, Heat, Etc.**  
D'Eate & Seelye Co.  
Eddy Valve Co.  
Jenkins Bros.

**Return Steam Traps**  
D'Eate & Seelye. (Curtis.)

**Rock Drills.** (See Air Compressor.)

**Roofing**  
Berlin Iron Bridge Co. | Scaife, Wm. B. & Sons  
Pheips, Dodge & Co. | Shiffer Bridge Co.  
Pittsburg Bridge Co.

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

**Scales.**  
Fairbanks Co.

**Screens**  
Aitchison, R., Perf. Metal Co.  
Denver Eng. Wks. Co.  
Fraser & Chalmers  
Gates Iron Works  
Harrington & King Perforating Co.  
Link Belt Machinery Co.  
Ludlow-Saylor Wire Co. (See Machinery.)

**Second Hand Machinery**  
Robinson & Orr.

**Separators**  
D'Eate & Seelye Co.

**Shoes and Dies**  
Chester Steel Cast. Co. | Fraser & Chalmers  
Cromie Steel Works. | Gates Iron Works.  
Crecent Steel Co. | Pierce & Miller Engi  
Denver Eng. Wks. Co. | neering Co.

**Shevels (Steam)**  
Bucyrus Steam Shovel & Dredge Co.  
Southern & Co.

**Smelting and Refining Works**  
Balbach S. & Ref. Co. | Orford Copper Co.  
Baltimore Cop' Wks. | Penna. Salt Mfg. Co.  
Bridgeport Copper Co. | Penn Smelting and  
Elliott's Metal Co., Ltd. | Refining Works.  
Kan. City S. & Ref. Co. | Phosphor-Bronze  
Mathison Smelting Co. | Smelt. Co.

**Steam Traps.**  
D'Eate & Seelye. (Curtis.)

**Steel Rails, Castings, Rolls, Drill Steel**  
Bethlehem Iron Co. | Pierce & Miller Engi  
Carpenter Steel Cast. Co. | neering Co.  
Chester Steel Cast. Co. | Robinson & Orr.  
Cromie Steel Works. | (See Metal Dealers.  
Crecent Steel Co. | Pollock, Wm. B. & Co.  
Garrison, A. Fdry Co. | Scaife, Wm. B. & Son.  
Moore, S. L., & Sons Co. | Taylor Iron & Steel Co.  
Jesop Wm. & Sons  
Denver Eng. Wks. Co. | Ltd.  
Gates Iron Works. | Walker Mfg. Co.  
Williams Mfg. Co.

**Telegraph Wires and Cables**  
Okonite Co., Ltd.  
Kearsarge Mg. Co.  
Osceola Con. Mg. Co.  
Tamarack Mg. Co.

**Temperature Regulators**  
D'Eate & Seelye. (Curtis.)

**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**  
Gates Iron Works.  
Stillwell-Bierce & Smith-Valle Co.

**Typewriters.**  
Wyckoff, Seamans & Benedict.

**Valves**  
D'Eate & 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.  
Lefel, 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.  
Sheffield Car Co.  
Taylor Iron & Steel Co.

**White Lead**  
Foster, Blackett & Co.

**Wire Cloth**  
Aitchison, R., Perf. Metal Co.  
Barnum, E. T.  
Gates Iron Works.  
Harrington & King Perforating Co.

**Wire Rope & Wire**  
Besley, Chas. H., & Co. | Gates Iron Woks.  
Broderick & Beacom | Hunt, C. W., Co.  
Rope Co. | Lechen, A., & Sons  
California Wire Wks. | Rope Co.  
Carpenter, G. B., & Co. | Phelps, Dodge & Co.  
Carpenter Steel Co. | R'bling, J. A. Sons & Co.  
Chanuon, H. Co. | Ropeways Syndicate.  
Cooper Hewitt & Co. | Trenton Iron Co.

**Wire Rope Tramway**  
Brown Holist & Conv. | Gates Iron Works.  
Mach. Co. | Hunt, C. W., Co.  
California Wire Wks. | Roebling, J. A., Son  
Colorado Iron Works. | & Co.  
Denver Eng. Wks. Co. | Ropeways Synd. I. t.  
Fraser & Chalmers. | Vulcan Iron Works

POSITIONS FREE ADVERTISING VACANT.

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.

1425 WANTED—A GENERAL MANAGER for an iron ore company making a large output. Familiarity with the Spanish language is desirable. Address with full particulars of experience and references, M. H. HIERRO, ENGINEERING AND MINING JOURNAL.

1426 WANTED—AN EXPERIENCED foreman capable of taking charge of the construction and operation of a lead refining plant of 20 tons daily capacity. Must have references from former employers. Address BULLION, ENGINEERING AND MINING JOURNAL.

1427 WANTED—A FIRST-CLASS ASSAYER and ore sampler, with a knowledge of the Spanish language, to take charge of an ore purchasing agency. References imperative. Address ORE BUYER, ENGINEERING AND MINING JOURNAL.

1429 WANTED—A MAN FAMILIAR with the refining of sulphur from its ores, by the most improved modern processes, and who can give estimates of cost of such plant. Address SULPHUR, ENGINEERING AND MINING JOURNAL.

1430 WANTED—A YOUNG MAN conversant with the Cyanide process and able to properly superintend the installation of plant. Moderate salary until ability is proven. Address, with references, TANKAGE, ENGINEERING AND MINING JOURNAL.

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.

1432 WANTED.—ELECTRO-CHEMIST for work on the Pacific coast. Must be familiar with the latest advances in electrolytic manufacture of commercial products from salt. Address PACIFIC, ENGINEERING AND MINING JOURNAL.

1433 WANTED—ANALYTICAL CHEMIST for factory in New York. One speaking the German language preferred. State experience, age and former employment. Address P. C. P., ENGINEERING AND MINING JOURNAL.

1434 WANTED—THOROUGHLY COMPETENT draftsman, familiar with designing steel buildings, roofs and columns, to take charge of office. Must understand how to handle men to good advantage. None others need apply. State where employed, remuneration required, and give full copies of recommendations. Address Box 22, ENGINEERING AND MINING JOURNAL.

1435 WANTED—A MINING MACHINERY salesman. State experience, age, salary desired, etc. Address SALESMAN, ENGINEERING AND MINING JOURNAL.

1436 WANTED—A CHEMIST PRACTICALLY familiar with the manufacture of petroleum products. Address PARAFFINE, ENGINEERING AND MINING JOURNAL.

1437 WANTED—ASSAYER AND ASSISTANT chemist, by a firm of refiners of the precious metals, near New York City. Address REFINERS, ENGINEERING AND MINING JOURNAL.

1438 WANTED—AN EXPERT PROSPECTOR to take charge of an expedition to the Orinoco country in South America. One thoroughly familiar with mineral-bearing, especially gold-bearing ores, and with experience and training to qualify him to take three or four men from the company's headquarters, which are to be established on the Orinoco, and thoroughly explore the interior. The company intends leaving New York near the middle of February, taking their boats and supplies with them. None but a first-class man need apply, and preference will be given to one understanding Spanish. The necessary expenses of traveling will be paid and reasonable compensation given in stock of the company at its cash value. Address, with references, qualifications, etc., ORINOCO, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

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

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.

GRADUATE MINING ENGINEER AND chemist desires position. Eleven years' successful experience in the economical management and development of mining properties and the milling of ores by amalgamation and cyanide process. Understands Spanish. Best of references. Address COLORADO, ENGINEERING AND MINING JOURNAL. No. 17,325, Feb. 22.

WANTED—POSITION AS CHEMIST AND assayer, age 27, 5 years' experience. Will go anywhere with responsible people. Have commercial education, scientific and practical knowledge of prospecting, some little of mine engineering, and a graduate in chemistry and assaying, can be useful; fair salary expected. Address "AU, AG, CU AND PB," ENGINEERING AND MINING JOURNAL. No. 17,353, Feb. 15.

A YOUNG CHEMIST AND ASSAYER, four years' experience, desires a position with some silver lead smelter or mine in Mexico or United States. Best of references. Address H. A., ENGINEERING AND MINING JOURNAL. No. 17,353, February 15.

MINING ENGINEER, of 20 years' experience in gold and silver exploration, mining, and milling, desires to change location. No objection to foreign countries or the Tropics. Ten years as superintendent and general manager. Familiar with amalgamation, leaching and concentration. Speaks Spanish. New York and Chicago references. Address MINING, ENGINEERING AND MINING JOURNAL. No. 17,358, Feb. 29.

Contracts Open.

TO BOILER MAKERS.—Proposals will be received at the Middletown State Homeopathic Hospital, Middletown, N. Y., for a 150 H. P. steam boiler, up to and including February 20, 1896. With proposal must be submitted detailed drawing showing construction and necessary foundation, smoke connections and setting; also specifications stating quality of material, number of square feet of heating surface and list of trimmings to be furnished with boiler. Proposal must include erection complete with steam, water and smoke connections made ready for service. Plans for subfoundation as well as setting to be approved by the Commissioner of the New Capitol. An Ashcroft pop safety valve, 10-in. brass case steam gauge, pressure damper regulator, water column glass gauge and try-cocks, shaking grates, flue cleaner and fire tools, as well as all valves and connections to be of stated make and quality. With bid must be submitted satisfactory evidence of the evaporative economy of the proposed boiler, either from tests made on one of same make and rating in actual service, or the evaporative economy must be guaranteed. Tests shall be conducted under the supervision of a competent engineer to be selected by the Commissioner of the New Capitol. Bids should be addressed to GRINNELL BURT, President Board of Trustees.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., February 3d, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 27th day of February, 1896, and opened immediately thereafter, for all the labor and materials and erecting complete either a hydraulic or an electric passenger elevator, including pumps, tanks, piping, car, etc., for the U. S. Court House and Post Office Building at Springfield, Mo., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Springfield, Mo. Each bid must be accompanied by a certified check for the sum of \$100. 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 inclosed in envelopes, sealed and marked, "Proposal for Passenger Elevator, etc., for the U. S. Court House and Post Office Building at Springfield, Mo.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., January 31st, 1895.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 26th day of February, 1896, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low pressure steam heating and mechanical ventilating apparatus, power boilers, etc., required for the U. S. Court House and Post Office Building at Detroit, Mich. in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Detroit, Mich. Each bid must be accompanied by a certified check for \$200. The right is reserved to reject any and 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 inclosed in envelopes, sealed and marked, "Proposal for the Low Pressure Steam Heating and Mechanical Ventilating Apparatus, etc., for the U. S. Court House and Post Office at Detroit, Mich.," and addressed to WM. MARTIN AIKEN, Supervising Architect.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., February 12, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 11th day of March, 1896, and opened immediately thereafter, for all the labor and materials required for furnishing and erecting complete one electric passenger elevator, including electric elevator engine, car, guides, wire screen work, Bostwick folding gates, etc., for the U. S. Custom House and Post Office Building at New Haven, Conn., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Custodian at New Haven, Conn. Each bid must be accompanied by a certified check for \$150. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for Furnishing and Erecting Complete One Electric Passenger Elevator in the U. S. Custom House and Post Office Building at New Haven, Conn.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., February 10, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 6th day of March, 1896, and opened immediately thereafter, for all the labor and materials required for the low pressure, return circulation, steam heating and ventilating apparatus for the U. S. Post Office building at Roanoke, Virginia, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Roanoke, Virginia. Each bid must be accompanied by a certified check for \$100. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the low pressure, return circulation, steam heating and ventilating apparatus for the U. S. Post-Office building at Roanoke, Virginia," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., February 10th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m., on the 3d day of March, 1896, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low pressure, return circulation, steam heating and ventilating apparatus, elevator power boiler, etc., for the United States Court House and Post Office Building at Wilmington, Del., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Wilmington, Del. Each bid must be accompanied by a certified check for the sum of one hundred and fifty dollars (\$150). The right is reserved to reject any or all bids, and so 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 inclosed in envelopes, sealed and marked "Proposal for the Heating and Ventilating Apparatus, etc., for the United States Court House and Post Office Building at Wilmington, Del.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

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Any stock upon which this assessment shall remain unpaid on the 11th day of March, 1896, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the 3d day of April, 1896, to pay the delinquent assessment together with the cost of advertising and expenses of sale.

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Continued from Page 18.

WATER-WORKS.—Sealed proposals will be received until February 20th, 1896, for furnishing the materials and constructing a system of water-works at Sea Isle City, N. J. There will be required cast-iron pipes, special castings, valves and boxes, fire hydrants, pumping machinery, stand-pipe, artesian wells, pipe-laying, etc. Each bid must be accompanied by a certified check drawn to the order of the President of The Sea Isle Water Company, for the sum of \$500. Proposals must be addressed to and plans and specifications may be seen at the office of GEORGE PFEIFFER, Jr., President, The Sea Isle City Water Company, 417 Market street Camden, N. J.

DAM, ETC.—SEALED PROPOSALS, MARKED "Proposals for Building Dam," will be received by the Town Clerk until the 25th day of February, A. D. 1896, for the building of a dam and public road in Butler Township, Schuylkill Co., Pa. Plans and specifications can be examined in the office of the Town Clerk, Frank Rentz, Centre street, Ashland, Pa. Specifications will be mailed on application. By order of the Town Council, ABRM. WATTS, H. F. BRIGHT, FRED. KRAPP, Water Committee.

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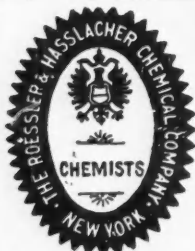
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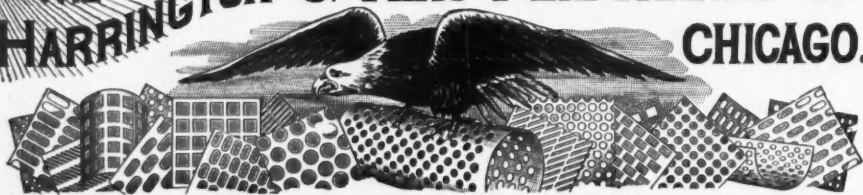
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