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Two of our English contemporaries, "Iron" and "Industries," have been united, both having passed under the management of Mr. C. A. PEARSON, who will hereafter publish them under the combined title of "Industries and Iron." Both are excellent technical papers, and each has had a marked individuality. "Industries," though comparatively new, has made itself a place in the field of technical journalism, in which "Iron" can lay claim to be one of the first comers, since it has been published continuously for 70 years. Started as the "Mechanics' Magazine" in 1823 it kept that title for 50 years, changing it to "Iron" in 1873. If our new-old contemporary keeps up to the standard of its progenitors it will fully deserve the success which we wish it.

THE inroads which the coal operators of the Kanawha district in West Virginia have made on the coal trade down the Ohio and Mississippi, which has been for so many years almost monopolized by Pittsburg miners, are a lesson on the inevitable result of strikes in the face of competition. The trouble with the miners in the Monongahela pools prevented the Pittsburg operators from supplying their river trade; the Kanawha coal men seized the opportunity and stepped in, securing a share of this important business which they evidently mean to hold. Given the chance, they have shown that their coal is well suited to the river markets, while they have the advantage over their Pittsburg rivals of shorter distance and the ability to ship without waiting for a rise in the river. No doubt Pittsburg coal will continue to be a formidable rival, but its exclusive hold on the river trade is lost.

THE report of the Suez Canal for 1892 shows that in that year 3,492 vessels passed through the canal, no less than 2,581 of them being under the British flag. Germany is second, but at long distance, with 292 ships; Holland third, with 177; and France fourth, with 174; no other nation had over 100. For years France was second in the number of ships using the canal, but gave place first to Germany and now to Holland. At first sight it seems strange that Norway, which owns a large proportion of the merchant vessels of the world, should have sent only 64 ships through the canal; but the Norwegian tonnage is chiefly composed of sailing vessels, and the Suez Canal is essentially a steamer route, the cost of towing through the canal and the dangerous navigation of the Red Sea making the route around the Cape of Good Hope preferable for sailing vessels in spite of its greater length.

THE experiments which the Tennessee Coal, Iron & Railroad Company is conducting at one of its furnaces, and which were referred to in our issue of June 17th, are of the utmost importance to many of the Southern iron men. Should they prove successful, as they now promise to do, they will open a wide field to the furnace owners who have relied on their pig iron alone, and will now be able to produce an iron adapted for the production of steel on a large scale, which they have not heretofore done. We have spoken before this of the necessity, if the Southern iron industry is to continue to prosper, of adding the manufacture of finished iron and steel to that of the raw product, pig iron; and this has been emphasized by the recent action of the railroads in raising freight rates and increasing the difficulties of competition with the Northern furnaces in the market. The result of the Tennessee Company's experiments will be watched with deep interest, and it is fortunate that they have been undertaken by a corporation with the means and ability to carry them through.

IN the case of the suit brought to foreclose a mortgage on mining property in California, an account of which is given in another column, the lower Court has decided against the holders of the bonds and in favor of the company, on the ground that the legal assent of the stockholders to the execution of the mortgage had not been proved. Should this decision be sustained on appeal it leaves the bondholders in a somewhat difficult position, as it is a question whether proceedings in equity will establish their lien on the property. A very similar case came up in a railroad foreclosure case nearly 20 years ago, in which the assent of the stockholders to the execution of a mortgage was defective. In that case the lower Court held that the bondholders had a lien on the property, but must come in, on proof of the amount of money furnished by them, with the unsecured creditors of the company. The case was appealed, but the appeal never came to trial, a compromise having been made by which the bondholders were allowed to join in a reorganization of the company.

THE increased production of petroleum from the Baku wells and the evident determination of the Russian producers to extend the use of their oil in all possible directions, will result in a sharper competition for the markets of China, Japan and India than has yet been the case. The Baku oil is already a factor of considerable importance in these countries, which are large consumers of petroleum, and every opportunity is seized to secure a further extension of the trade. Recently some shipments have been made in tank steamers through the Suez Canal from Batoum, and this line seems to be proving quite a successful one. How important the trade is expected to be is shown by the fact that the Russians are seriously discussing the construction of a pipe line to some point

on the Persian Gulf, which will very much shorten the sea voyage and reduce the cost of transportation. It is evident that the American petroleum trade with the East will be done hereafter under different conditions from those which have prevailed for a number of years, and it may soon become an important question whether it can be profitably carried on at all.

THE manufacture of steel by the Thomas process, which began with 20 tons in 1878, has steadily increased, and last year a production of 3,202,640 metric tons was reported. It is in Germany that this process has found its greatest development. Introduced in 1879, it was found peculiarly suited to some German irons, and the output has increased each year, reaching 2,013,481 tons last year. France and Austria are nearly equal, the former showing last year 287,528 and the latter 288,122 tons—both a considerable increase over 1891. In England the production has been more variable, reaching a maximum of 593,400 tons in 1890 and falling off last year to 496,839 tons—a reduction of over 19 per cent. How much of this was due to an abandonment of the process and how much to the general falling off in the steel trade are not indicated by the returns. In the United States the use of the Thomas process is first reported in 1890, when 77,779 tons were made; the production increased to 110,116 tons in 1890, but fell off again to 91,729 tons last year. It is probable, however, that a considerable gain will be shown in the current year, and a further extension in the use of the process is to be expected.

ONE of the practical results of the working of the Pennsylvania Commission on Waste in Anthracite Coal Mining appears in a series of experiments undertaken by Mr. ECKLEY B. COXE, one of the members of the Commission, on the best form of furnace and grate for burning coal dust and the smaller sizes of coal. The first outcome of these experiments is the patenting by Mr. COXE of a furnace for this purpose. For locomotives the question has been solved, so far as combustion is concerned, by the Wootton boiler; but that boiler has the disadvantages of being costly to build and difficult to stay securely under the high pressures at which locomotive boilers are worked.

In view of the improvements which are being made in electrical transmission, the question may arise before long whether the best and most economical way of using the coal may not be found in establishing great power plants close to the mines, where the coal may be burned and from which the power and heat generated may be transmitted by wire to the points where they are needed. In this way the waste and loss incident to transportation of the coal would be avoided, and in working on a great scale a degree of economy in boiler and engine practice might be reached which is not attained under our present system. It is for the electrical engineers to say what can be done in this direction, which certainly opens a promising field for their future efforts; in which, however, they may have the assistance of the coal miners, but will certainly not receive any from the coal carriers.

THE American tin plate industry will suffer a serious handicap after July 1st through the provisions of Section 209 of the McKinley tariff law, which was presumably passed to protect the tin mining industry of Dakota and California, and according to which there shall be imposed, after July 1st, 1893, on cassiterite, or black oxide of tin, and upon bar, block and pig tin a duty of 4 cents per pound; but if the product of the mines of the United States shall have exceeded 5,000 tons of cassiterite and bar, block and pig tin in any one year prior to July 1st, 1895, then all imported cassiterite bar, block and pig tin shall after that date be admitted free of duty. Up to the present time the pig tin output of the United States has been, according to Mr. WM. BENEDICT, in "The Mineral Industry," about 150 tons, divided as follows: California, 134 tons; Dakota, 10 tons; and Virginia, 8 tons. As none of the mines are now being worked, it may be taken for granted that neither 5,000 tons nor, indeed, any considerable part of it will be produced before July 1st, 1895, and the duty will consequently cease on that date by limitation. It is, however, highly probable that long before that Congress will repeal the section and others similar to it and allow the free entrance of raw materials. Meanwhile importers and users of pig tin have made provision against the duty by laying in a big stock of metal, the imports for April being 7,146,086 lbs., worth \$1,467,234, against 4,893,618 lbs., worth \$940,508, during the corresponding month of 1892. The imports for the 10 months ending May 1st, 1893, amounted to 41,833,381 lbs., worth \$8,465,714, against 32,987,780 lbs., worth \$6,469,913, during the corresponding period of 1892. It is expected that the imports of May and June will show a still larger increase.

THE reorganization plan of the Philadelphia & Reading has failed, and will not be carried out. At the time set for the closing of the assets there were still 70,000 shares of stock and \$10,500,000 of the general mortgage bonds less than the amount required for the plan to become operative, assented to it. An effort was made to extend the time for receiving assents, but the syndicate of bankers which guaranteed the plan, and which had agreed to take the new collateral mortgage bonds and coupon certificates, would not agree to any such extension, and withdrew from their

guaranty. This failure is said to have resulted chiefly from the refusal of New York holders to come into the plan, most of the Philadelphia stock having been deposited. A day or two previously to the expiration of the time President HARRIS stated that the failure of the plan would make necessary a default on the July interest on the consolidated bonds, and there is little doubt that this interest will not be paid. What further action will be taken remains to be seen, as no one seems to be ready as yet with a new plan of reorganization. There is considerable talk among some of the bondholders, especially in New York, of a foreclosure and of proceedings to test the right of the company to pay dividends under lease agreements made subsequent to the date of the mortgage. Whether this will amount to anything more than talk also remains to be seen, but it is not unlikely that some applications of the kind will be made to the Court. Meantime, the request of the receivers for leave to issue certificates to meet pressing liabilities, including the SPEYER loan, which becomes due July 1st, has not been acted upon. This loan and others of considerable amount are secured by collateral, most of which consists of securities of controlled companies, the loss of which would be important. Just at present the future of the company seems to be entirely uncertain, and it is difficult to predict what the outcome will be further than to say that a foreclosure seems to be by no means impossible. The forfeiture of the Lehigh Valley lease and a discontinuance of the present system of coal purchases may also be among the possibilities, though, as we have already said, no predictions are safe just now.

IMPORTS OF GOLD.

Since the cessation of the outward movement there has been much hopeful discussion regarding the probability of imports of gold, this reaching its culminating point on Wednesday, June 21st, when it was announced that a prominent banking firm had ordered \$500,000 in gold in London. This calls renewed attention to our remarks on trade balances and movement of gold in our issue of May 27th. We then showed that our indebtedness to Europe on current account amounted to \$81,500,000, following which we said: "We look for no permanent amelioration until the Silver Purchase Act be repealed, when foreign confidence in our financial policy will be restored."

The statement of our annual indebtedness to Europe, which was given in that article, if brought up on the same basis to June 1st, would give a balance of \$89,822,000 due European current account. Of this sum a part has probably been permanently invested here, and a part has been loaned on call or time loans. In face of this statement are gold imports now possible? Or, to put the question in another form, will exchange drop to such a point that the importation of gold will be profitable? We think not. Sporadic importations may be made from time to time, but no inward movement of consequence can occur until the balance of merchandise trade turns in our favor, or confidence in our financial policy be fully restored by the repeal of the Sherman Silver Purchase Act. The importation of the \$500,000 above referred to we regard as entirely sporadic, an isolated case made probably on the spur of the moment at little profit for the sake of the honor of being the first importer of gold, and rendered possible by a temporary panic in the exchange market. To understand this it will be necessary to briefly review the condition of the money market.

During the last six months money has been getting more and more stringent owing to a number of causes, chief among which have been exportation of gold and consequent decrease of actual stock; the reduction in credit money as shown by decreased deposits and loans; increased need of money consequent upon increased imports of merchandise, and failures and forced liquidations caused by the disastrous break in industrial and other stocks, all of which were either the direct outcome of or were intensified by the ever-growing fear that the Government could not maintain gold payments. At the beginning of the month the want of confidence, which had been in large part confined to the East, had spread throughout the country; failures became numerous, and runs were made on a large number of banks. This resulted in a strong demand for currency to strengthen the reserves of Western and Southern banks, and \$25,000,000 have been withdrawn from New York for this purpose. The stringency caused by this demand, the break in wheat in Chicago, which stimulated exports, and the declaration of the President that an extra session of Congress would be held in September to consider the financial situation brought about a cessation of gold exports. Sterling exchange dropped, but not low enough to permit a return movement of gold.

Meanwhile the demand for currency for the West continued, and last week the New York Clearing House Committee decided, as a matter of precaution and in order to relieve the financial stringency, to issue clearing house certificates. At the beginning of the present week the situation was as follows: No bank had applied for certificates, and the belief was general that the weak banks which really needed this help were afraid to disclose their condition by taking out certificates; this in turn caused a belief that some were in a shaky condition. Confidence

was at a low ebb, and the exchange market rather than the stock market temporarily went to pieces. On Monday some grain and sterling loan bills were offered at low rates, actual transactions being done at \$4.84½ to \$4.85, but buyers were few. On Wednesday the situation reached its culminating point, the same class of bills breaking to \$4.83 simply because buyers were less eager to buy than sellers to sell.

This rate permits of the importation of gold at a profit, but as soon as it was announced that \$500,000 would be imported, exchange jumped 1 cent higher. At the same time money became easier in consequence of the report of taking out of clearing house certificates by the Bank of Commerce, the report that the Government would advance the July interest payment, and a decreased demand for currency for the West. To still further clinch the matter, the Bank of England raised its rate for bar gold to 77s. 10d. per oz. In other words, the opportunity was over, and it is not probable that it will occur again for some time.

While the firm of BARING, MCGOON & CO has the credit of being the first importer of gold during the season, it is highly probable that the firm would have made more money by keeping the bills of exchange bought for a few days and reselling them at an advanced rate. Since Wednesday morning, when the bills are supposed to have been purchased, exchange has advanced from \$4.83 to \$4.855, a gain of 2½ cents per £1, which, on \$500,000, or £103,132, would amount to a gross gain of \$2,578; or, subtracting interest for three days at 6 per cent., a net gain of \$2,333.

The profit on the gold imported was as follows: \$500,000 in standard gold coin weighs 26,875 oz., which at 76s. 9d. per oz., the quoted Bank of England rate, cost £103,132 16s., which, with exchange at \$4.83, is equal to \$498,131. To this should be added freight, insurance and incidentals, making the total cost \$499,253. The gross profit was accordingly \$747, but if interest be deducted the net profit is very small. It may be added that the Bank of England has raised its buying price for American gold coin to 76s. 6d., the selling price remaining 76s. 9d.

NEW PUBLICATIONS.

THE IRON ORES OF GREAT BRITAIN AND IRELAND: WITH A NOTICE OF SOME OF THE IRON ORES OF SPAIN. By J. D. Kendall, F. G. S. London: England: Crosby, Lockwood & Son. Pages, 433; illustrated. Price (delivered in New York), \$8.

In this book the author has given a carefully written and detailed account of the occurrence and probable origin of the iron ores of Great Britain, bringing together in compact form a mass of information hitherto scattered through various publications and the papers of different technical associations, and adding to this much original matter from his own researches and observations. He has divided his book into four parts, the first being chiefly historical and giving an account of the early working of iron ores; the second treating of the geological position, form and nature of iron ore deposits; the third on the age and origin of these deposits; and the fourth on searching for iron ores, the various methods of working them, the working costs and selling prices and the terms and conditions of mineral leases. Some chapters on Spanish iron ores have been added on account of the importance of those ores to the British ironmaster. The author has evidently a practical knowledge of his subject, as well as an acquaintance with its literature and theory, and he has treated it carefully and thoroughly.

The very great importance of the iron ore deposits to the industrial interests of Great Britain ought to make the book a valuable one to the ironmasters and manufacturers of that country, as it is certainly more nearly complete than any work heretofore published. While its interest in this country is more remote, there are several chapters on the origin of iron ore deposits which will be of interest, while the account of the different methods of working and of working costs will also interest those who are engaged in similar operations. In his introduction Mr. Kendall has some very sensible remarks on the importance of geological study and knowledge, and the waste and loss which have been caused by the lack of them in many cases.

The illustrations would have been improved in many cases if they had been made on a somewhat larger scale, and their number might have been increased with benefit to the book. There are two excellent points, a thorough index and very complete reference to authorities cited, both valuable in a book which is likely to be an authority for some time to come.

THE QUESTION OF SILVER. By Louis R. Ehrlich. New York: G. P. Putnam's Sons; 1892. Pages 115. Price, 75c.

This book is made up of two papers, one read before the Monday Evening Club of Colorado Springs, Colo.; the second a reply to a reply called forth by paper No. 1. Both papers were written in 1891, when the passage of a free coinage bill by Congress seemed imminent. It is popularly supposed that every one in Colorado is an advocate of the free coinage of silver, but against this measure Mr. Ehrlich speaks in no uncertain terms. On this point, after showing how the average annual output of silver increased 127% during the years from 1876 to 1890, he says: "It is now impossible for the United States, single-handed, with free and unlimited coinage, to bring silver to a parity with gold on any such basis as 16:1."

Mr. Ehrlich presents his arguments in a plain way that convinces the reader, unless already prejudiced in favor of the use of the white metal at any and all hazards. Attention is then called to the harm being done to the business interests of the country by the continued agitation of the silver question, and the demand is made that such shall cease. So far the book is worthy of commendation, and we cheerfully accord it. On the other hand, we fail to understand how Mr. Ehrlich arrives at many of his conclusions or beliefs from the data

given. For example, Mr. Ehrlich demonstrates that the fall in the value of silver is natural; that it is consequent upon an increased supply and decreased demand; that it began many years ago, before demonetization by Germany or the United States; that it "has been struck down, not by the act of 1873 nor any bill concocted by man, but by the irresistible hand of nature," and then proceeds to say that he would favor free silver coinage if the legal tender quality was not given to the coins; that he can see a basis of reason in the free coinage of American silver only, and, what appears as most surprising, that "in order to bring about European co-operation, it will be necessary to recoin our silver at a ratio of 15½:1."

We strongly suspect that Mr. Ehrlich jokes at times, as for example when he approves of free coinage without the legal tender quality, but we believe that the book would have carried greater influence without such statements.

BOOKS RECEIVED.

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

University of Colorado: *Summer Bulletin*, 1893. Boulder, Colo.: Published by the University.

Errors in School Books. By A. A. Pope, Boston, Mass.: Published by the author. Pamphlet, 40 pages.

Displacement and Renewal of Gold. By James P. Kimball, Washington; published by the author. Pamphlet, 24 pages.

Massachusetts State Agricultural Experiment Station, Bulletin No. 47. Boston, Mass.: State Printers. Pamphlet, 16 pages.

Seventh Annual Catalogue of the Agricultural and Mechanical College of Texas. Austin, Tex.: State Printers. Pamphlet, 80 pages.

Summary Report of the Geological Survey Department for the Year 1892. Ottawa, Canada: Printed by order of Parliament. Pages 64.

Money: Its Origin, Its Internal and International Use and Development. By J. C. Leaver, London, England: Edinham, Wilson & Co. Pamphlet, 32 pages; price, in New York 40 cents.

Geological History of the Rawdon and Boothorpe Faults in the Leicestershire Coal Field. By W. S. Gresley, Newcastle-upon-Tyne, England: Andrew Reid, Sons & Co. Pamphlet, 8 pages.

Proceedings of the Lake Superior Mining Institute, Including the Minutes of the Inaugural Meeting. F. W. Denton, Secretary, Houghton, Mich.: Published by the Institute. Pamphlet, 30 pages.

The Choice of Coarse and Fine Crushing Machinery and Processes of Ore Treatment. By A. G. Charlton, Newcastle-upon-Tyne, England: Andrew Reid, Sons & Co. Pamphlet, 102 pages.

The Bimetallic League: Report of the Annual Meeting in Manchester. Manchester and London, England: Published for the League. Pamphlet, 112 pages; price in New York, 10 cents.

Amonedaciones e Introducciones de Metales Preciosos a las Casas de Moneda, Ano Fiscal de 1891-92. Noticias formadas bajo la direccion de Javier Stavoli, Jefe de la Seccion 7. City of Mexico: National Printing Office.

Explosifs de Sureté: Grisoutites, Wetter-dynamites, Explosifs a Base d'Azotate d'Ammoniaque. Par A. Macquet, Ingenieur au Corps de Mines. Paris, France: Bandy & Cie. Pages 594; illustrated. Price, in New York, \$4.20.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

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

The Dry Process for Treating Nickel Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Mr. R. M. Thompson's letter in your issue of June 17th will be read with great satisfaction by every person interested in the progress of "nickel winning" in this country, though it may not be completely relished by foreign producers. If Mr. Thompson's words, "Orford nickel produced by exclusively dry process from Canadian pyrrhotite ores, 99.23%," are to be read and understood literally, I think I voice the opinion of the whole scientific world when I say that the achievement thus recorded stamps Mr. Thompson and his colleagues as being the most eminent metallurgists of the day. I presume, therefore, that in the public interest you will permit me, through your columns, to ask the following questions:

1. Does the figure 99.23 represent nickel and cobalt together or pure elemental nickel alone?
2. Can any indication be given as to the constituent parts of the remaining 0.77%? In particular, what are the percentages of copper and arsenic?
3. Do the words "exclusively dry process" mean that at no stage of the process has any part of the nickel been in solution?

YOUNGWOOD, Pa., June 19, 1893.

STEPHEN H. EMMENS.

Variations in the Milling of Gold Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The sketch and description of an Australian gold mortar, or, as the author calls it, "coffer," with end and front discharges given by Mr. Rickard in the Journal for June 10th, is interesting, but it does not seem to me that he has proved its value. He says that mortars with end gratings are usually condemned because the end discharge is weak and irregular, defects which are cured at Harrierville by using end screens of larger mesh. The end screens have 175 round holes to the square inch and the front screens 240 holes, which correspond, I presume, to 1 millimetre and ¾ manholes.

The obvious criticism upon this statement is that the front discharge is choked off in order to force more pulp through the end screens. If

the ore will yield its gold well when crushed to 175 mesh, what reason is there for crushing it to 240 mesh? According to Mr. Rickard's explanation, the end discharge in the Harrierville mortar would probably become "weak and irregular" if screens of 175 mesh were replaced in front. That is true, and it shows at once where the natural and proper discharge of a mortar is. Mr. Rickard speaks of the single screen, front discharge mortar as a "dull uniformity." My experience is that it represents the uniformity of success. I have no doubt that such a mortar with screens of 175 mesh would crush more than 1½ tons per 24 hours with 700-lb. stamps with 8-in. drop, and falling 70 to the minute, as at Harrierville.

The facts given about amalgamation show that the ore is decidedly "free," and it would be interesting to know whether the amalgamating surface has not passed its limit of usefulness. Plates 6×12 ft. are 50% larger than those in common use in this country; but has this extra surface any value in working an ore that yields one-third of its amalgam in the mortar, though the mortar contains no copper plates? I often find millmen who believe that a plate 8 ft. long would do all that a plate of any length can do, and I would like to know what your readers think on that subject. A plate 6×8 ft. might be better than one 4×12 ft., and if so would not be either difficult or costly to build mills to suit them.

Other departures from American practice are readily perceived; for instance, the extreme thinness of the mortar bottom and the excessive weight of stamp shoe, which is 172 lbs. in a 700-lb. stamp. With us an 850-lb. stamp usually has a shoe of about 125 lbs. The Australian proportion must give a very light stem, probably 2½ or 2¾ in., or an extremely light tappet and boss, particulars in which the heavier American practice has been controlled entirely by the results of experience.

NEW YORK, June 8, 1893.

JOHN A. CHURCH.

The Persistence of Ores in Lodes in Depth.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Owing to absence from London I have only now seen Mr. T. A. Rickard's rejoinder to my letter on this subject. His objections to my figures seems to rest on the following points: 1. That I only deal with the richness and not the quantity of ore produced; and 2, that they are confined to the mines on the Highburrow lode. As to the first point, I confess that I supposed that the facts as to production were sufficiently well known, or at any rate easily ascertainable. The Government statistics give the following figures of average yearly production of 15 of the principal producers in the Carn Brea district for each of four decades past, in tons of "black tin": 1853-62, 1,883; 1863-72, 3,735; 1873-82, 6,899; 1883-91, 8,502. The Dolcoath mine especially shows for the last decade an average yearly output of 2,236 tons, against 640 in the first decade given.

With respect to the second point, I stated previously that reliable figures of yield (i. e., richness) from the other mines were not easily obtainable. Some—as East Pool and South Condurrow—have lately shown a considerable falling-off in this respect; but, on the other hand others—notably Wheal Grenville—have improved. I think it would be generally admitted that, on the whole, the yield from the mines on the Great Flat Lode has been fairly uniform.

It is true that Cornwall, like all old mining regions, is "dotted over with silent engine houses;" but the greater portion of these belong to abandoned copper and lead mines; abandoned, not because of any general falling-off in productiveness with depth, but because they could not produce these metals remuneratively in competition with the larger and cheaper worked deposits in the United States and elsewhere. As to the abandoned tin mines, I need hardly point out that the fact of a number of abandoned mines having accumulated over a long period of time does not prove that they became poor in depth. Most of them, doubtless, never paid at all; and of the rest, the majority stopped working at some period of temporary poorness, shortness of funds, low prices, or from some of the hundred other causes which constantly bring mining enterprises to grief, apart from their intrinsic merits. Taking Cornish tin mines as a whole, the number has decreased; but, subject to fluctuation, the aggregate production remains fairly constant. It is simply a result of the general law that under modern conditions big mines can pay when small ones cannot. Moreover, in the special district under consideration, not only has the production greatly increased, but the number of mines working is not much less.

The argument that, because certain mines have stopped work, therefore the lodes have become poorer in depth, is, as shown above, entirely inconclusive. But, apart from this, I must point out that, of the mines to which Mr. Rickard refers as having stopped operations in 1892, only one (Violet Seton) is situated anywhere near the Carn Brea district, and that one is not a tin mine at all! This in itself affords a somewhat striking illustration of the difficulty of conducting a discussion as to the actual condition of mining in any particular district from the distance of some few trifling thousands of miles.

LONDON, England, May 13, 1893.

GEORGE E. COLLINS.

"The Mineral Industry" for 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I take pleasure in acknowledging receipt of a copy of your "Mineral Industry." It is a wonderful encyclopaedia of mineralogical economics.

BESSEMER, Mich., June 6, 1893.

C. M. BOSS, Inspector of Mines.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In the "Mineral Industry" you have produced a compendium of information of great value. There was need for just such a reference book, and in furnishing it you have done excellent work that will be appreciated by all interested in the industries of which it treats.

E. F. EURICH,

Chicago and Aurora Smelting and Refining Co.

AURORA, Ill., June 7, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: "The Mineral Industry," like all other publications undertaken by yourself, is a marked success, and will be referred to as highest authority. The technological chapters are of great value to the metallurgist and chemist, as they bring the subjects treated up to date. It is my opinion that it contains more information of value to the mining fraternity than there is in any other single volume.

FRANK W. GIBB,

Mining Engineer, Assayer and Chemist.

LITTLE ROCK, Ark., June 3, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The mining and smelting industries of the country are certainly under great obligations to you for publishing thus early such complete and reliable information regarding the quantity and cost of the mineral products. The great value of your work to the practical man lies in its timeliness. Needed information is afforded before it gets so old as to lose the greater part of its value.

GEORGE FAUNCE,

Superintendent Pennsylvania Lead Co.

PITTSBURG, Pa., June 2, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We congratulate you heartily on the issue of your lately completed work, "The Mineral Industry"; it fills the gap heretofore existing in technical literature in a most desirable manner. We thank you sincerely for the handsome book, which has become an ornament of our library. The work will be reviewed on its merits in our publication, and we beg to express the wish that it may find that acceptance to which its contents justly entitle it.

F. VON GRUBER,

President Austrian Engineers' and Architects' Society.

VIENNA, May 26, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: If an expression of opinion regarding "The Mineral Industry" (as you have so aptly named the "Engineering and Mining Journal" supplement for 1892) from one who was not entirely disinterested in its preparation will be acceptable to you, I take much pleasure in saying I have had occasion to refer to it many times with satisfaction to myself and, I trust, for the good of others. The comprehensiveness of its statistics and technological details makes it a volume that certainly is very valuable to the mining profession, and also to business men generally. It is a great credit to you and the "Journal," and you may well be proud of it.

W. DE L. BENEDICT,

Mining Engineer and Metallurgist.

NEW YORK, June 5, 1893.

Mining in Siberia.—The Russian Government has ordered the establishment of a school of mines at Irkutsk for the special purpose of training mining engineers for service in Siberia.

The Hodgkins Prizes.—Prof. S. P. Langley, Secretary of the Smithsonian Institution, announces that in accordance with the terms of the donation made by Mr. Thomas George Hodgkins, of Setauket, N. Y., the Institution now offers the following prizes, to be awarded on or after July 1, 1894, should satisfactory papers be offered in competition:

1. A prize of \$10,000 for a treatise embodying some new and important discovery in regard to the nature or properties of atmospheric air. These properties may be considered in their bearing upon any or all of the sciences, e. g., not only in regard to meteorology, but in connection with hygiene, or with any department whatever of biological or physical knowledge.

2. A prize of \$2,000 for the most satisfactory essay upon: (a) The known properties of atmospheric air considered in their relationship to research in every department of natural science, and the importance of a study of the atmosphere considered in view of these relationships; (b) the proper direction in future to search in connection with the imperfections of our knowledge of atmospheric air, and of the connections of that knowledge with other sciences. The essay, as a whole, should tend to indicate the path best calculated to lead to worthy results in connection with the future administration of the Hodgkins foundation.

3. A prize of \$1,000 for the best popular treatise upon atmospheric air, its properties and relationships (including those to hygiene, physical and mental). This essay need not exceed 20,000 words in length; it should be written in simple language and be suitable for publication for popular instruction.

4. A medal will be established, under the name of the "Hodgkins Medal of the Smithsonian Institution," which will be awarded annually or biennially for important contributions to our knowledge of the nature and properties of atmospheric air, or for practical applications of our existing knowledge of them to the welfare of mankind. This medal will be of gold, and will be accompanied by a duplicate impression in silver or bronze.

The treatise may be written in English, French, German or Italian, and should be sent to the Secretary of the Smithsonian Institution, Washington, before July 1, 1894, except those in competition for the first prize, the sending of which may be delayed until December 31, 1894.

The papers will be examined and prizes awarded by a committee to be appointed, as follows: One member by the Secretary of the Smithsonian Institution, one member by the President of the National Academy of Sciences, one by the President pro tempore of the American Association for the Advancement of Science, and this committee will act together with the Secretary of the Smithsonian Institution as member ex-officio. The right is reserved to award no prize if, in the judgment of the committee, no contribution is offered of sufficient merit to warrant an award. An advisory committee of not more than three European men of science may be added at the discretion of the Committee of Award.

MINING AT THE COLOMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.

THE COLORADO STATE EXHIBIT.

Colorado displays her mineral resources attractively near the main entrance to the Mines Building. Numerous cases filled with ores line the two closed sides of the pavilion. Along the aisles great masses of gold and silver ores form an effectual barrier. Numerous beautifully polished columns of building stones ornament the interior, while above all of these a massive coal column raises its head. Displayed attractively in the center of the pavilion is \$16,000 worth of pure gold. The gold is in glass cases, and arranged so advantageously that it is a source of constant admiration from all. The accompanying cut shows how generally the State is represented. As a whole, it compares most favorably with the States that can be called its competitors, and the amount of ores in weight and value undoubtedly surpasses all others. The exhibits are arranged by counties, each county having a separate space.

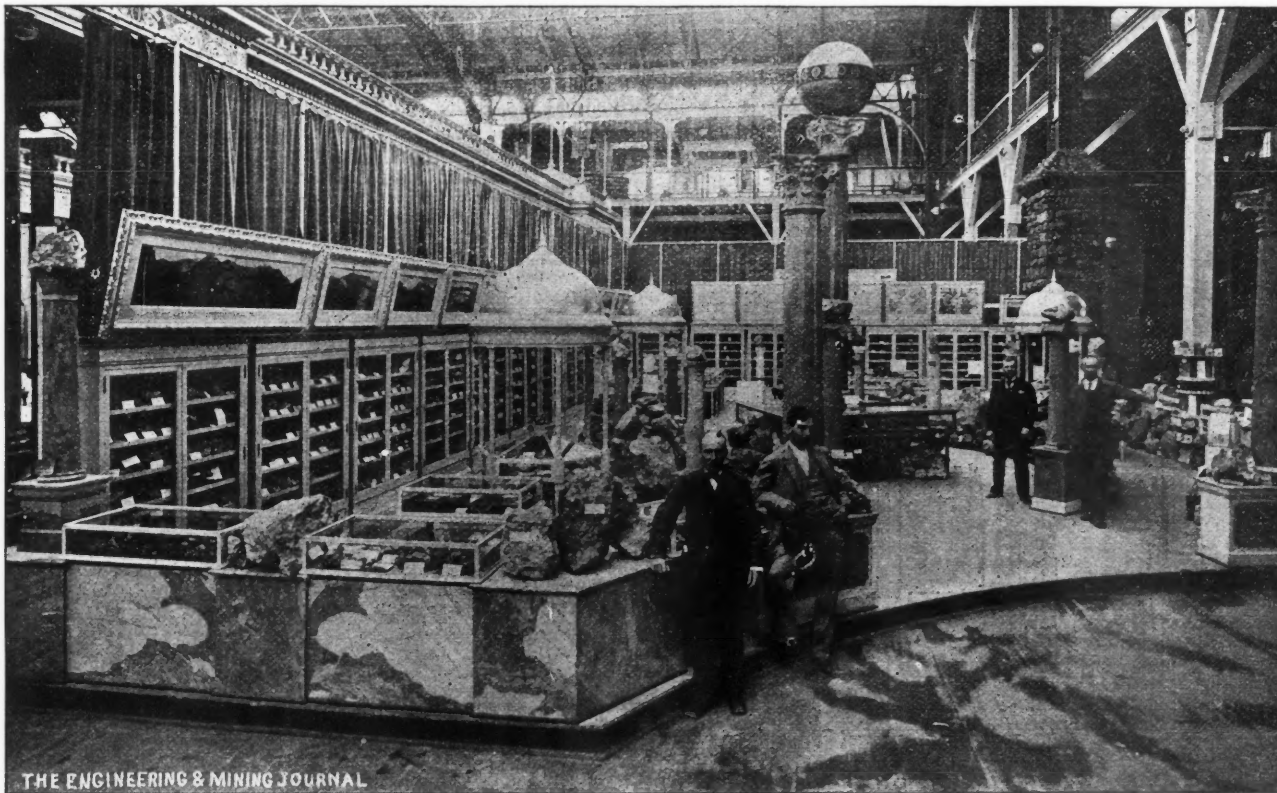
To the general public the reputation of Colorado as a gold and silver producer has overshadowed its other mineral resources, so that few appreciate how great they are. It is true that the value of the gold output last year reached about \$5,540,000 and the silver \$31,480,000; but a reference to the columns of the "Mineral Industry," where all the mineral production of the State is given in detail, shows that in coal the output has risen gradually and steadily from the small beginning of 4,500 tons in 1870 to 3,771,234 tons in 1892; coke, which

the gallery has a magnificent trophy in the form of a silver barge and various metallurgical products.

From the Leadville district the Chrysolite mine sends fine high-grade specimens containing embolite or bromo-chloride of silver.

The A. Y. & Minnie mine sends galenas assaying 59 oz. silver and 80% of lead; the Forest City mine, hard carbonates rich in chloride of silver, some assays reaching 2,500 oz. to the ton. This is an exceptional and interesting exhibit. The Lion silver mine sends rare specimens of carbonate ores assaying 175 oz. to 1,166 oz. silver and 68% of lead. The Wolfstone, the Dunkin, the Emmett, the Mike & Starr, the Catalpa & Crescent and others have silver ores of high grade. Gunnison County has the Hawkeye, Fairview, Indiana, Stanley, Little Nell, May, Eureka, Jack Whacker and others with galena and sulphide of silver and gold-bearing ores, the Fairview sending an especially attractive display of rich silver ores. Clear Creek County is represented by the Salisbury mine, and many others with specimens of peacock and other sulphide ores containing gold and silver. Cripple Creek representations are numerous. Among them are Blue Bird mine, with specimens of telluride or gold in fluor spar averaging \$100 to \$1,200 per ton.

The Zenobia mine sends free-milling gold quartz; the Free Coinage gold quartz valued at \$700 per ton. The Elkton mine has ores showing free gold, one specimen valued at \$7,264 per ton. The Fremont mine displays free milling gold quartz; the Anaconda fine ores showing free gold; the Fort Worth mine gold ores averaging \$1,100 per ton, and the Pharmacist mine free gold specimens and ores averaging from \$25 up.



THE ENGINEERING & MINING JOURNAL

THE COLORADO STATE EXHIBIT.

was not made in the State before 1880, showed a production of 452,750 tons, an increase of 50% in two years; and the blast furnaces turned out 32,441 tons of pig iron. The production of copper was 7,250,000 lbs., the largest ever reported in one year. The only important mineral product showing a decrease last year was lead, of which the output for four years has been 69,000 tons in 1889, 54,500 in 1890, 64,000 in 1891 and 61,500 in 1892.

The coal industry, one of the most important in the State, is shown by the Atchison, Topeka & Santa Fe Railroad, the chief coal carrier. This company has erected a column or trophy of coal 8 ft. square at the base and 24 ft. in height; this, when completed, will be the largest trophy in the building, with the possible exception of that of Pennsylvania's anthracite. A granite column presented by Mr. McGilvray, of Denver, occupies the centre of the pavilion. It is surmounted by a globe 3½ ft. in diameter, bearing the name of the State. The column is 17 ft. high. At a convenient distance from this shaft 11 stone columns are arranged so as to form a circle about it. These smaller columns are also of Colorado building stone, and are the contributions of various quarry owners. At the main entrance stand two handsome columns, over 12 ft. high. They are composed of the Platte Canon granite, and are the gifts of Geddes & Seerie. The variety and beauty of its building stone are not the least of the advantages of which the State can boast. Its resources also include, as the "Mineral Industry" shows, asphaltum and other valuable minerals not yet worked in large quantities.

Naturally the gold and silver exhibit is the most generally attractive. From Aspen the Mollie Gibson mine sends specimens of high-grade native silver ores averaging from 68 oz. to 25,000 oz. per ton silver. The Aspen mine likewise sends high-grade native silver ores, and in

Creede camp sends from the Amethyst silver ores which run 150 oz. to the ton. The Last Chance, the Ridge, Nancy Hanks, Yellow Jacket and others have silver ores. The San Miguel mine, San Miguel district, displays a mineral piece of ore assaying \$7 to \$8 gold per ton. The Ben Butler sends petzite or telluride of gold and silver averaging—tellurium, 32½%; silver, 42½%; gold, 25½%.

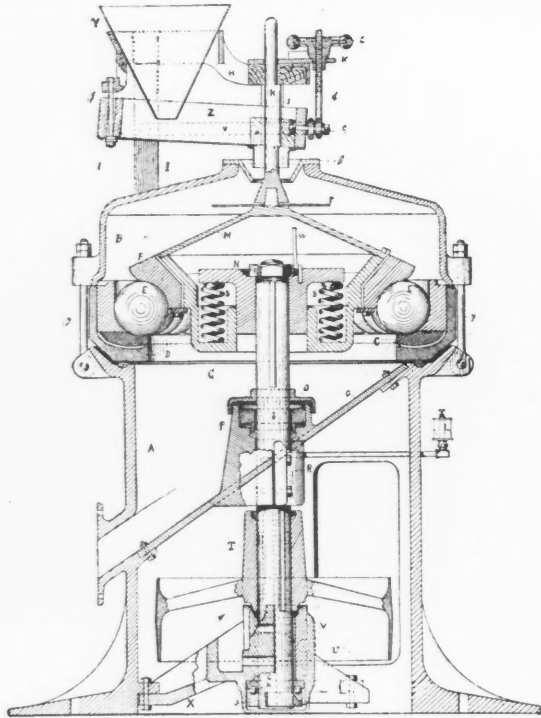
The display of gold from Breckenridge is superb; gold to the value of \$16,000 is displayed in cases set out in the center of the pavilion; wire gold, placer gold, nuggets and other forms of gold fill the bottom of the cases. All the specimens are of a beautiful bright color. H. E. Wood, of Denver, Colo., exhibits several pretty silver and gold roses. The owners of these gold specimens are Messrs. E. J. Collingwood, C. A. Finding, P. L. Cummings, R. Foote, Geo. Crow and Hiram Johnson, all of Breckenridge.

The Blue Gem mine, of Villa Grove, displays pretty specimens of turquoise. William Shaw Ward, D. Sc., of Denver, is chief of the Colorado Mining Department in the Exposition. Mr. Ward's experience as Colorado commissioner to the Paris Exposition of 1889 has served him well, and the State exhibit shows the results of energy and method in its collection and arrangement.

SOME MACHINERY EXHIBITS.

One of the best machinery exhibits in the Mines Building is that of the American Mining and Milling Machinery Company, of Cleveland, O., a general view of which is shown in the accompanying cut. The general arrangement, it will be seen, is attractive, and the machinery is well placed. The first of the smaller engravings shows in section this company's American rockbreaker and ore crusher, made under the Morris patent. This machine is a crusher with oval work-

ing jaw and concave back, giving the mouth of the crusher a crescent shape. In place of the side plates in common use, the upper wearing die is extended down each side of the lower or working jaw, making a discharge space along the sides of this jaw as well as across the lower end. The upper end of the working jaw is of simple construction, fastened to the box of the eccentric. The central part of the jaw rests upon a toggle. This gives the jaw a double motion—a sort of rocking or cradle motion—which adds greatly to the efficiency and accelerates the discharge of crushed material. This construction also gives the same motion to the lower end of the jaw that it does to the upper end, which not only increases the capacity, but has a tendency to make the surface of the dies wear more evenly. The support given near its middle part by the toggle adds to the strength of the working jaw, and the round or oval form gives the frame the greatest possible strength for its weight. The crusher is adjusted to coarse or fine work by means of a wedge located beneath or back of the working jaw, which is raised or lowered by means of a threaded bolt, turned by a socket wrench provided for the purpose. Raising or lowering the wedge raises or lowers the working jaw and produces a fine or coarse product at will. The adjustment of the jaws is also a ready means of taking up the wear of the dies at all points, and adapts the crusher to all kinds of work. The wearing parts consist of three fixed crushing plates on stationary jaws or frame and one crushing plate or die on working jaw, all simply and securely fastened in place. These plates or dies are plain castings, made of hard iron or steel or a mixture of the two materials. When set for crushing, the machine will deliver, at the rate of from two to four tons per hour, a $\frac{1}{4}$ -in. product, about one-half of which will pass through a 10-mesh screen.



THE AMERICAN BALL PULVERIZER.

When set for coarser work, such as is preferred by stamp mill men, the quantity of product will be greatly increased.

The American ball pulverizer, which is also shown in section, is made in four sizes, and is capable of handling from 3 to 100 tons of ore per day, depending on the hardness of the ore and the fineness required. It is an anti-friction, ball-bearing granulator adapted to either dry or wet grinding; no screens are required for ordinary ore. The company claims for this mill that it will accomplish a greater amount of work with less power than any machine of its class. It is the only machine of its kind in which the outlet is equal in superficial area to its opening or inlet. Ores are crushed to the fineness of corn with a small amount of power, owing to the three distinct motions given to the ore at the same instant. Wear is reduced, and by the use of a steel screw the jaw is adjusted to deliver any size required. Its wearing parts are composed of an upper track, lower track circle of three balls, all easily and cheaply replaced. The balls wear perfectly round, two motions being given, one around the track and one on the apex of the balls, and this is very important. There is no slipping, sliding or pounding. The wear and tear is a minimum. A capacity of one ton per hour is had with the No. 2 machine. The No. 3 is good for 50 tons per day, and the No. 4 for 100 tons.

In the general view is also seen the high drill derrick of the M. C. Bullock Company, and some of that company's marketable and business-like exhibit, to which we shall refer on another occasion.

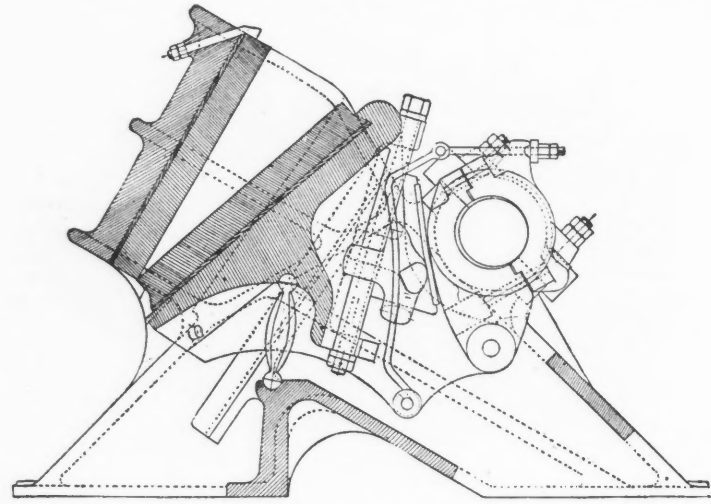
The Joseph Dixon Crucible Company is the only concern in the world which manufactures every article of which graphite is a component part. With the invention by Joseph Dixon in 1827 of the plumbago crucible, the crucible business was revolutionized. At that date began also the manufacture of Dixon's stove polish, foundry facings and the development of an industry now grown to enormous proportions. This company has two exhibits at the Fair. One is of Dixon's American graphite pencils in the northeast gallery of the

Manufactures Building, and the other, covering all the other articles manufactured by them, in the northeast gallery of the Mines and Mining Building. The pencil exhibit occupies a space 10×14 ft. In the centre of this space stands a low mahogany table surmounted by a pyramid of velvet, which is covered with pencils, arranged in graceful and beautiful designs by an artist employed specially for that purpose. Over this pyramid stands a rosewood and plate glass case. Two ornamental facades of turned and carved mahogany front the space, which is separated from neighboring spaces by means of Japanese bead curtains, suspended from carved grills.

The company's exhibit of general and special graphite products in the Mines and Mining Building occupies a space 25×28 ft. A very handsome cherry facade fronts the space, while the sides are hung with tastefully arranged portieres. Crucibles, retorts, ladles, stopper-heads and nozzles, graphite boxes, phosphorus chargers, resistance rods and devices, incandescent filament forms and other special goods made of graphite are shown in upright cabinets. In another case is shown the development of an electrotype plate, in which process the use of graphite is an essential. In still another case are shown over 50 varieties of graphite, for as many different uses and under as many different names, such as graphite for lubricating, stove polish, foundry facings for green, dry or loam castings; core wash, ingot mold wash, shot and powder glazing, electrotypers', gilders' use, hat-ter's use, rubber packings, piano and organ actions, potleading yachts, for crucibles, lead pencils, paint pigment, lubricants, etc. There are also shown samples of graphite from all the principal sources from which that article is obtained. One very fine sample from the island of Ceylon weighs nearly 300 lbs.

The Dixon company was the first to complete the exhibit, and their promptness brought forth a very complimentary letter from the Chief of the Department.

English Patents.—During 1892 applications were made for 24,171 British patents, 19,269 single designs and 258 sets of designs, and 9,101 trade marks. The gross receipts in 1892 were £199,859, against an expenditure of £96,822, both amounts being a good deal smaller than in 1891. While the number of applications for patents continues to increase, the percentage of patents granted is shown to be gradually diminishing. "This," says the recent report of the Comptroller-General,



THE AMERICAN ROCK BREAKER.

"is doubtless in some measure owing to the advantage taken by inventors of the provisions of section 4 of the Amendment Act of 1885, which prescribed that abandoned applications should at no time be open to public inspection or be published by the Comptroller. Consequently inventors who may be unable to proceed with their applications within the term first allowed by law are now in a position to renew their applications from time to time without risk of losing their rights, which would have taken place under the law as it stood before the amendment above mentioned. However, notwithstanding the diminished proportion of applications which obtain patents, the total number of patents issued annually has considerably decreased since 1885."

Hematite and Martite Iron Ores in Mexico.—The existence of this class of iron ores in Durango was known as long ago as 1882, the Cerro Mercado, or Iron Mountain, having been described by Professor Silliman and Mr. John Birkinbine. A second deposit has now been described by Mr. T. Hill as existing near Monclova in Coahuila. The ore is interesting on account of its peculiar mineralogical condition, martite being a pseudomorph of hematite after magnetite. Of the Coahuila deposit Mr. Hill says: "Where the interior of the vein is exposed by blasting its mass consists of bright specular hematite, but this would not be inferred from a surface examination, for everywhere the mass has the appearance of black magnetite, and close examination shows it studded with minute octahedral crystals of martite."

The ore occurs along the line of contact of limestone and diorite, but frequently masses of ore are found wholly inclosed in either the limestone or diorite. The ore bodies cannot be called lenses nor are they true bed, and they have evidently been formed by replacement of limestone at its contact with the diorite, or by replacement of limestone masses originally inclosed within the diorite. The ore, chemically speaking, is quite pure, containing no sulphur, manganese lime, magnesia or titanium.

THE SPRING VALLEY MORTGAGE CASE.

The case of William Alvord and others against the Spring Valley Gold Company, of Butte County, Cal., and others, recently decided by Judge J. E. Prewett, of the Superior Court of Butte County, is of unusual interest and importance to all interested in mining; and especially to stock and bondholders in mining corporations in the State of California. The questions involved are besides important in themselves as abstract legal propositions. The prominence of the parties to the action, Hon. William Alvord, of California; H. B. Laidlaw, the New York banker; Charles Waldeyer, the Spring Valley Gold Company of Butte County, Cal., and others, has, no doubt, materially added to the general attention that the case has attracted. The facts are that the Spring Valley Hydraulic Gold Company, the predecessor of the defendant company, in 1881, found itself in debt about \$465,000, without means to pay the same, and in that year issued \$200,000 in bonds, secured by mortgage upon the property of the company in Butte County, Cal. The mortgage, which embraced "all and singular the real estate and water rights belonging to the company," and attempted to cover all property which it might acquire in the future—was executed and delivered to the plaintiffs. William Alvord, H. B. Laidlaw and another resident of California, as trustees for the bondholders. Subsequently the property of the original company was transferred to a new company, the Spring Valley Gold Company, the defendant, by the deed of the former company, subject, as it seems to have been presumed, to the mortgage; but in the deed to the new company the trust mortgage was not more specifically described and set forth than to recite the existence of a "mortgage upon its property in Butte County, Cal." It was not stated that the conveyance to the defendant company was subject to this mortgage; nor, when, to whom, nor for

gage, which they formally did. Then, of course, the completion of the transaction—the delivery of the mortgage—was in, and of, California, and subject to its laws; and, therefore, the action was not barred by them. This brings us to what the court deemed the controlling question in the case, which was whether the execution of the mortgage was ratified by the requisite number of stockholders, as required by the statute of California of 1880.

The plaintiffs contended that the execution of the mortgage was duly ratified in California by a meeting of the stockholders held for that express purpose; and by the filing of the assent of the trustees to accept the trust created by the mortgage in the office of the county clerk of Butte County and other concurrent acts. Counsel for defendant most strenuously and with much force contended to the contrary.

The court did not take plaintiffs' view as to this, but deemed the ratification of the execution of the mortgage defective, and while intimating that a valid ratification of the execution of the trust mortgage could be effected in other ways than by a strict compliance with the statute of 1880 the court found that there was no proof to show that the requisite number of stockholders had signed the assent filed, nor had ratified the execution of the trust mortgage.

The court cites from the evidence that while the minutes of the meeting to ratify shows that 160,223 shares were voted upon, that much of this was by proxies, and no authority of the proxies to vote the shares was shown, while some proof was offered to show that the assents signed to the execution of the mortgage were defective.

The court held that enough had been shown to prove that the assent purporting to be signed by the stockholders to the execution of the mortgage would not meet the requirements of New York, nor those of the statutes of California of 1880. The court says: "If it is necessary at all to show that a certain amount of stock was



EXHIBIT OF THE AMERICAN MINING AND MILLING MACHINERY COMPANY.

what purpose it was given. Many of the stockholders in the former company were stockholders in the new. The new company declined to recognize the mortgage as valid against it, and the trustees named therein were put to their action to foreclose. The Spring Valley Gold Company (the new company) and Charles Waldeyer and others, who had subsequently acquired some interest in the property, strenuously opposed the foreclosure suit. At the trial there were few controverted questions of fact as the facts above stated were generally agreed to by both sides.

The questions of law presented to the court, it seems, were most minutely and fully presented by both sides, upward of two weeks having been occupied in their argument. The questions deemed of importance as applicable to the case were:

First. Was the meeting of the directors that authorized the president and secretary to sign the mortgage regular and legal? The defendants contending that it was not. If this meeting had not been regular the court would not need to look further; that would have concluded the case in favor of defendants. The signature of the officers and what purported to be the corporate seal were attached to the mortgage, from which the court rightfully presumed that the right to execute it existed. In view of other questions in the case, which the court deemed controlling, it was not thought necessary to ask for further proof.

Second. A further question, deemed of much importance, was, whether the signing, in New York, by Laidlaw, of the certificate, accepting the trust, made the execution of the mortgage, as done in the State of New York, instead of California. If it did, which defendants contended, the statute of limitations of California, where the action was brought, would run against the mortgage, and it would be barred and could not be prosecuted in that State, and plaintiffs would fail in their case. But it seems that it was the intention that the execution of the mortgage should not be deemed complete until the trustees residing in California had signed the certificate accepting the trust created by the mort-

gaged or represented it is necessary that it was represented by the owners or their authorized agents, otherwise the whole purpose of the law might be defeated by scheming directors, who would cause the books to show that the stock was represented without any detailed statement as to who represented it, and the discovery of the cheat would be very difficult."

Upon these considerations the court rendered its decision in favor of defendants. The execution for costs against plaintiffs was stayed for 60 days pending the perfecting of an appeal if plaintiffs are so advised.

As the matter now stands the holders of the \$200,000 of bonds are out the amount paid for them. By the rule of the common law and the California statute of 1880 the ruling of the court may be unassailable; but if the bondholders are without a remedy by the common law or under the statute, it is a question if they have not a remedy in equity, to have a decree holding the mortgage an equitable mortgage and perpetuated as a lien upon the property of the defendant company. The outcome of the appeal or other proceedings that may be instituted by the defeated plaintiffs will be watched for with much interest.

Persia.—As regards the mineral wealth of the country, Persia may be divided into five zones. The first, Azerbaidjan, is particularly rich in iron, lead, copper, saltpetre and coal; in the second, which extends from Rudbar to Asterabad, there are mines of iron, lead, copper and coal. The third zone comprises Khorassan, of which the mines near Nishapour are rich in turquoises, and those in the other parts of the province in copper, lead, coal, salt and silver. The fourth zone includes Kirman, Ispahan and Shiraz, and contains, in addition to copper, lead and silver-manganese, marble, mercury, antimony, cobalt, nickel and sulphur. The fifth zone, comprising the littoral of the Persian Gulf, is said to be rich in petroleum.

THE MINERAL PRODUCTION OF GERMANY IN 1892.

We give below, from advance sheets furnished by the Imperial Bureau of Statistics, the mineral and metal production of Germany for the year 1892. In this table the production is given in metric tons (2,204 lbs.) and in kilograms. The values are in dollars, the German mark being valued at 25 cents:

MINERAL PRODUCTION OF GERMANY IN 1892.					
Minerals.	Quantity.	Value.	Minerals.	Quantity.	Value.
Coal, tons.....	71,327,752	\$131,724,000	Pyrites, tons.....	113,461	\$210,359
Lignite, tons....	20,977,931	14,438,750	Other vitriol and alum ores, tons.	2,973	2,619
Graphite, tons....	4,036	63,240			
Asphaltum, tons.	53,279	104,750			
Petroleum, tons.	14,527	220,000			
Rock salt, tons....	659,322	703,000			
Kainit, tons.....	548,445	1,955,750			
Other potash salts, tons.....	802,630	2,528,500			
Epsomite, tons....	10,207	22,357			
Boracite, tons....	179	13,772			
Salt, tons.....	499,606	3,455,250			
Chloride of potash, tons.....	123,961	4,106,500			
Sulphate of potash, tons.....	26,267	1,072,000			
Sulphate of magnesia.....	23,879	84,000			
Sulphate of potash and magnesia, tons.....	11,593	223,250			
Sulphate of aluminum, tons.....	23,388	564,825			
Alum, tons.....	1,276	117,590			
Iron ore, tons....	11,539,235	10,319,852			
Zinc ore, tons....	800,167	5,305,324			
Lead ore, tons....	163,372	3,674,881			
Copper ore, tons.	567,630	5,128,221			
Silver and gold ores, tons.....	19,319	916,378			
Cobalt, nickel and bismuth ores, tons.....	3,185	199,537			
Tin ore, tons....	63	18,554			
Arsenic ore, tons.	2,148	19,491			
Manganese ore, tons.....	32,891	127,014			
Uranium and Wolfram ores, tons.....	48	11,057			
			Total.....	108,370,670	\$187,285,129
			Metals:		
			Pig iron, tons....	4,913,174	\$56,987,252
			Zinc, tons.....	139,938	13,765,510
			Lead (p'g), tons.	97,936	5,145,560
			Litharge, tons..	3,468	201,765
			Copper (pig), tons.....	24,778	6,188,432
			Copper, matte and black, tons.	625	24,630
			Silver, kilos.....	457,784	14,253,396
			Gold, kilos.....	2,877	2,001,379
			Cadmium, kilos.	3,000	2,830
			Tin, tons.....	684	309,974
			Nickel, bismuth and uranium, tons.....	1,238	1,713,581
			Antimony and manganese, tons.....	249	44,931
			Arsenic, tons....	1,667	109,177
			Sulphur, tons....	668	13,819
			Sulphuric acids, tons.....	436,389	3,410,120
			Sulphate of iron, tons.....	8,670	53,179
			Sulphate of copper, tons.....	4,001	279,410
			Sulphate of zinc, tons.....	4,390	65,369
			Tin salts, tons....	89	27,003
			Coloring earths, tons.....	2,629	68,316
			Total.....		\$104,668,703

For purposes of comparison we add the accompanying table from the "Mineral Industry" for 1892, giving the official figures for the production of Germany for the seven years 1885-1891. The complete tables in the book give the production from 1878. It will be seen that

WASTE IN ANTHRACITE COAL MINING.*

(Concluded from page 558.)

The commission especially calls attention to the great importance of the quantities of culm, bony coal and slate coal in the dirt banks and to the fact that this is being rapidly increased, although at the present time a much smaller proportion of the finer sizes of coal is thrown away than was the case in former years. In these banks there is a large amount of fuel which can be used to advantage; it is the opinion of the commission that not only is the culm available, but that a large percentage of the slate banks, if properly sized, could be used with economy and profit in making steam, provided it can be burned near the spot where it is and does not have to bear much expense for transportation. The firm of Coxe Brothers & Co., have already begun to investigate the subject with a view of building a furnace to determine how high the percentage of ash in bony and slate coal must be to prevent its use economically in large quantities. The great industrial establishments which have been built up around Scranton by the use of this cheap fuel may be given as an instance of what it is possible to do in this line. In an appendix to the report the commission gives a list of a large number of grates and other appliances for burning coal dust and small sizes of coal, and also a list, which is of considerable value, of the different literature upon the subject, including papers presented before scientific societies, articles in technical and other journals and the like. This appendix is very valuable for reference for any one desirous of studying up the subject.

Another valuable appendix prepared for the commission shows the amount of coal which has been taken from the coalbeds of the various anthracite regions and the amount still remaining in the ground, which can be removed under profitable commercial conditions. This estimate, while of course in part based upon conjecture, has for its foundation the careful examination of a large number of existing workings, and the surveys and examinations made at different times of the coalbeds. At the same time an attempt has been made to establish some average as to the amount of coal which has been wasted and lost either in mining or preparation. This, however is a very difficult matter, owing to the great differences in local conditions and to losses which it is impossible to estimate; as, for instance, the damage to upper coal beds by breaking and settling of the strata where the lower beds are first worked; the coal left unmined along the outcrops to keep out surface wash, the amount destroyed by mine fires, and the coal left in pillars. A careful consideration of the subject and a study of the data obtained and its probable value as relating to the past output lead to the conclusion that since the

MINERAL PRODUCTION OF GERMANY.—Continued.

Metric ton = 2,204 lbs. 4 marks = \$1.

MINERAL.	1885.		1886.		1887.		1888.		1889.		1890.		1891.	
	Metric Tons.	Dollars.	Metric Tons.	Dollars.	Metric Tons.	Dollars.	Metric Tons.	Dollars.	Metric Tons.	Dollars.	Metric Tons.	Dollars.	Metric Tons.	Dollars.
Coal.....	58,920,398	75,735,539	58,056,598	75,181,924	60,383,984	77,769,327	65,386,120	85,265,892	67,342,171	96,269,970	70,237,808	194,511,033	73,715,653	147,379,551
Lignite.....	15,355,117	10,094,458	15,625,986	10,055,566	15,898,631	10,050,345	16,573,903	10,224,096	17,631,059	11,087,328	19,053,026	12,442,209	20,536,625	13,541,457
Graphite.....	3,359	40,128	2,906	30,425	2,960	46,585	3,353	46,925	3,377	43,122	4,355	73,921	3,821	73,540
Asphaltum.....	45,412	64,037	42,894	54,018	31,483	46,531	41,524	63,812	43,496	81,311	51,144	94,497	49,150	93,628
Petroleum.....	5,815	117,654	10,385	240,386	10,444	233,280	11,920	256,973	9,591	220,290	15,225	310,508	15,315	298,259
Rock salt.....	377,491	488,806	414,307	537,664	405,420	465,516	414,557	453,937	544,591	563,704	557,060	618,301	666,793	734,754
Kainit.....	242,281	929,641	240,421	880,753	239,412	852,254	318,576	1,166,666	324,477	1,181,655	361,827	1,299,939	472,256	1,701,640
Other Potash Salts.....	678,662	1,852,766	704,849	1,938,058	840,691	2,359,260	916,759	2,561,931	861,273	2,601,592	913,030	2,826,199	898,993	2,771,494
Epsomite.....	4,207	9,409	13,850	28,301	33,255	44,565	13,269	26,198	10,931	21,237	8,030	17,449	7,454	16,314
Boracite.....	140	16,782	144	13,043	153	15,397	180	14,367	121	9,059	182	13,710	177	12,660
Iron ore.....	9,157,869	8,478,355	8,485,758	7,410,833	9,351,106	8,501,318	10,664,308	9,940,280	11,002,188	11,617,129	11,406,132	11,957,255	10,657,521	9,852,076
Zinc ore.....	683,654	1,911,852	703,177	1,330,502	900,712	2,505,524	667,761	3,436,753	708,829	4,422,495	759,437	5,833,938	792,544	6,238,384
Lead ore.....	157,820	3,773,304	158,505	3,979,656	157,570	3,980,810	161,777	4,170,963	169,569	4,432,581	168,231	4,524,880	159,215	4,163,988
Copper ore.....	621,381	4,813,628	495,756	3,603,835	507,587	3,637,928	530,956	4,379,758	573,290	4,549,752	596,100	5,041,683	587,626	5,216,192
Silver and Gold ore.....	24,561	1,070,469	21,230	1,119,095	25,726	1,044,430	20,390	1,017,150	22,264	1,010,433	21,360	1,146,000	22,569	1,151,723
Tin ore.....	196	47,419	131	41,662	126	41,260	152	45,700	120	32,817	102	29,267	75	22,839
Quicksilver ore.....														
Cobalt, Nickel, and Bismuth ore.....	617	134,092	344	121,385	319	135,868	339	145,269	793	125,059	976	159,338	1,074	159,328
Antimony ore.....	5	393	2	176	2	170	2	110	1	62	1	75	1	41
Arsenic ore.....	1,814	28,996	1,140	16,513	323	4,972	1,521	20,484	2,668	30,855	2,655	32,658	3,124	32,563
Manganese ore.....	16,628	104,757	27,050	203,837	38,395	255,731	28,710	167,037	45,167	236,738	41,841	196,379	40,335	202,445
Uranium and Wolfram ore.....	31	9,877	48	22,002	33	16,549	42	9,345	45	13,618	42	9,274	47	10,564
Iron Pyrites.....	116,212	239,660	113,656	224,736	101,136	192,824	109,516	212,129	117,306	222,653	122,372	251,939	128,288	239,468
Other Vitriol and Alum ores.....	7,207	4,889	2,523	1,876	550	1,156	515	1,181	696	1,496	1,379	1,921	2,406	1,517
Totals.....	85,817,986	109,968,914	85,153,750	107,636,835	88,872,991	112,201,460	95,866,230	123,676,896	99,414,053	138,775,011	104,322,319	181,411,533	108,762,065	198,925,125
METALLURGICAL:														
Pig-iron.....	3,687,434	40,356,629	3,528,658	35,566,527	4,023,953	41,610,652	4,337,121	47,830,067	4,524,558	54,342,633	4,658,451	66,894,961	4,631,218	58,107,003
Zinc.....	129,098	8,465,042	130,854	8,630,291	130,494	9,149,352	133,224	10,905,920	135,974	12,333,655	139,266	15,598,177	139,353	15,639,337
Pig-lead.....	93,134	4,853,097	92,520	5,525,180	94,921	5,233,797	96,995	6,211,947	100,601	6,372,531	101,781	6,407,359	95,615	5,816,587
Litharge.....	4,186	214,775	3,876	223,954	4,446	260,897	4,571	290,721	3,924	255,307	3,972	264,071	3,124	197,317
Copper (pig).....	20,628	5,309,638	20,021	4,326,517	20,848	4,542,999	21,569	7,881,699	24,597	7,027,161	24,455	7,228,966	24,302	7,011,268
Copper (matte & black).....	342	22,339	423	27,005	416	43,228	1,010	88,550	263	25,267	793	66,026	596	46,139
Silver, kilos.....	309,418	11,034,448	319,598	10,676,867	367,633	12,039,502	406,608	12,869,059	408,037	12,709,162	402,945	14,037,716	444,852	14,749,420
Gold, kilos.....	1,378	963,728	1,065	743,584	2,251	1,570,370	1,738	1,250,953	1,958	1,306,477	1,855	1,290,417	3,077	2,141,966
Tin.....	107	48,681	79	42,877	66	26,905	84	46,680	63	30,096	64	30,887	27	131,181
Sulphuric Acid.....	343,235	3,397,051	352,723	3,166,579	382,894	3,181,430	398,797	3,368,392	429,739	3,531,244	464,044	3,828,918	467,633	4,018,746
Copper Sulphate.....	5,410	471,566	4,712	337,189	4,797	318,716	4,416	357,604	4,818	504,698	5,854	624,757	3,502	288,938
Unenumerated.....	14,609	1,229,480	15,075	1,316,330	16,423	1,447,801	19,086	1,349,919	19,535	1,670,522	19,839	1,816,790	21,805	2,088,133
Total tons.....	4,298,244	76,116,474	4,118,911	70,612,929	4,679,258	79,825,649	5,016,873	92,454,511	5,244,072	100,162,733	5,418,519	118,069,015	5,317,435	110,236,017
Total kilos.....	310,796		3,91,663		369,884		408,396		404,995		404,800		447,929	

while the total value of product in 1892 varies but little from 1891, there were several changes worthy of note. In iron ore and pig iron

and since 1868 by Mr. John H. Jones, show the shipments to January 1st, 1893, and the production for the same period, adding 10% for consumption at mines, to have been:

	Shipments. Tons.	Production. Tons.
Wyoming region	382,991,423	421,000,000
Lehigh region.....	147,652,656	162,500,000
Schuylkill region.....	289,719,916	318,500,000
Total.....	820,362,995	902,000,000

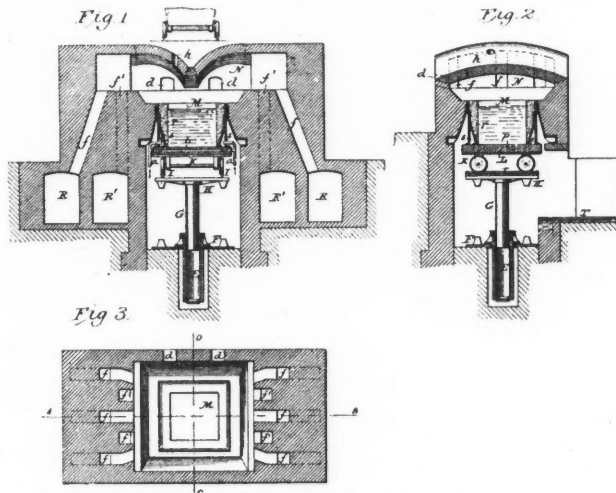
Basing the estimate on the supposition that for every ton produced 1½ additional tons are lost, the following table would show the probable amount of coal still contained in the ground:

Region.	Estimated original contents. Tons.	Amount used up 2½ times production. Tons.	Estimated contents remaining. Tons.
Wyoming.....	5,700,000,000	1,052,500,000	4,647,500,000
Lehigh.....	1,500,000,000	406,250,000	1,193,750,000
Schuylkill.....	12,290,000,000	796,250,000	11,493,750,000
Total.....	19,500,000,000	2,255,000,000	17,245,000,000

This estimate shows 17,245,000,000 tons of marketable coal still in the ground; what per cent. of this will be won, the future alone can determine. It is to be doubted whether the total coal won when the field shall be abandoned will exceed 40% of the total contents. An estimate on that basis would show the available marketable coal still now in the ground to be as follows:

Wyoming region.....	1,859,000,000 tons.
Lehigh region.....	477,500,000 "
Schuylkill region.....	4,561,500,000 "
In all.....	6,898,000,000 tons.

The amount of coal won at the modern colliery due to improvements in mining methods, the appliances for handling the coal, and in the utilization of the small sizes shows a decided advance over the earlier years of mining; a still further advance will undoubtedly be made in these directions, and the mining of the small beds, where a larger per cent. can be won, will all tend to increase the total. Future estimates for a long time will in all probability show an advance in the total per cent. won.



NAU'S METHOD OF CASTING STEEL INGOTS.

In considering the estimates given above it must be remembered that the difficulty and cost of mining must continue to increase on account of the greater depth at which the coal must be reached, and the increased amount of water to be pumped. A point must be reached in the case of every mine where the amount of coal required for hoisting and pumping engines would exceed the amount which could be marketed from the mine, when, of course, the results would cease to be profitable.

What proportion of coal taken from the mines now remains in the culm banks it would be impossible to determine without a survey of all the banks in the region. Some careful tests made by Mr. Heber S. Thompson at the Hammond colliery, have already been published in the "Engineering and Mining Journal" for April 29th, page 394. Other estimates have been made at different collieries, including some of the oldest in the anthracite region, and some of those more recently opened, and the conclusion reached by the commission is as follows: "Taking into consideration that the proportion of coal now sent to the dirt bank is much less than formerly and the annual production greatly increased, it perhaps, would not be unfair to estimate that since the commencement of mining the coal and coal dirt sent to the culm banks has been 35% of the total production, or say 315,700,000 tons."

The report of the commission is accompanied by a geological map of the anthracite region, and by a number of carefully prepared tables of much value for reference.

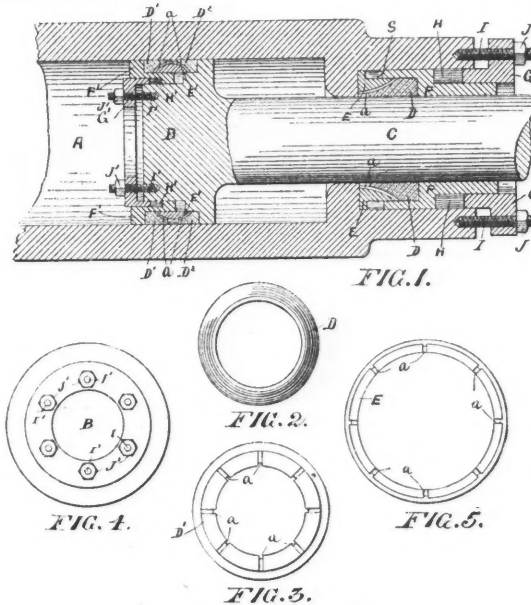
THE NAU METHOD OF MAKING STEEL PLATES.

A method of casting steel ingots has recently been devised and patented by J. B. Nau, of Allegheny, Pa., the object of which is to secure a gradual cooling from the bottom so as to avoid the formation of blow-holes and hollow spaces in the center. The accompanying illustration shows the general arrangement. Instead of teeming the steel, as is done in the ordinary practice, into molds, the steel ladle with its contents is brought over a heating furnace of which the bottom is left out entirely, and in its place has a mold of sufficient capacity to receive all the steel contained in the ladle. This mold is mounted on a car, which

can be raised or lowered by means of hydraulic machinery located in the foundation of the furnace. It is lined inside with refractory material of sufficient thickness to prevent a too rapid cooling of its contents. The outer iron casing of which the mold is made presents at its lower part a double shell, which is largest at the base and decreases to nothing at its upper point. The bottom of the mold, which may be lined also with refractory material, is a cast-iron plate with a coil of pipes inside. This coil, as well as the double shell at the lower part of the mold, is arranged to admit of the circulation of water to cool the lower part of the ingot.

The operation is as follows: The mold, after having been raised in the furnace, is heated up to a suitable temperature. The metal is then cast through a hole in the roof of the furnace. The temperature inside is kept high during the casting as well as afterward, in order to keep the upper regions of the ingot liquid, while its lower part is made to solidify by means of the circulation of cold water. If found necessary, the mold can be lowered gradually in order to increase the cooling effect at the bottom, while the upper surface remains exposed to the intense temperature of the furnace. By these means it will be made possible to obtain the solidification of the ingot in an ascending way and to avoid the formation of a hollow space in the upper region. A sound ingot will be the result. Of course these means of casting can only be used when heavy ingots are required, as in the manufacture of armor plate, for instance.

The solidification can be obtained in two different ways. The metal can be made to cool rapidly upward, and segregation of the non-metallic elements will be avoided to the same extent as it is obtained in the ordinary manner of teeming. Or the mass can be made to solidify slowly in an ascending way, and segregation of the non-metallic elements will be fostered. An ingot of heterogeneous character, containing more carbon in the upper than in the lower region, will be obtained. This will be of great importance in the manufacture of armor plates, because it will admit of producing an ingot with more carbon on one than on the other side.



THE LOSS HYDRAULIC PACKING.

Another advantage, however, that may be derived from this method is the facility with which ingots with different physical characters and different chemical compositions on the opposite ends can be obtained. When the ingot has been solidified to a certain height, and before the upper region has passed from the liquid to the solid state, a new addition of different composition and different nature can be made on top. The block thus obtained, transformed later by means of hammering or rolling into a plate, will furnish a finished compound product, while the particular method of casting will largely contribute to avoid the blow-holes and eliminate the danger of a hollow space.

THE LOSS HYDRAULIC PACKING.

The accompanying illustration shows a new form of hydraulic packing, invented and patented by H. V. Loss, of Philadelphia, in which the inventor has endeavored to combine the adjustability of the hemp packing with the self-packing feature of the U-ring. As applied to the piston rod it consists of a ring of some elastic material, having a hole through its center for the passage of the piston rod and having preferably a wedge-shaped cross-section. E is a ring or backing which surrounds the piston rod and is seated within the cylinder casting. The interior of the ring is conical in form, and the packing D enters at the larger end. If preferred, this ring may be turned from and form part of the cylinder A. F is a sleeve, the forward end of which surrounds the piston, and the rear end of which passes over and secures the forward ends of the packing D and backing E. G is a gland and H a packing of any suitable material—hemp, for instance—which is interposed between the gland G and a shoulder on the sleeve F; a are grooves upon the interior of the backing E, through which the water from the cylinder, after passing along the piston rod, finds its way to the top of the packing D, and exerts its pressure to close this packing tightly against the piston rod. There may be as many of these grooves as may be found necessary, but six or eight have been found to be sufficient.

In putting the packing into place the ring E is first passed into the seat S, which is formed in the front end of the cylinder casting; the packing D is next passed over the piston rod, its rear end projecting well into the larger end of the backing ring, as shown; the sleeve F is next put into place and surrounds the top of the backing and bears also against the forward end of the packing D, while its sides bear against the cylinder and piston rod. The hemp packing H, which prevents any escape of water between the sleeve F and the cylinder A, is then put in place, and finally the gland G is put in place and forced in as tightly as necessary by means of the bolts I and nuts J. The packing D operates to maintain a tight joint around the piston rod by the pressure of water upon its back. When this packing wears, causing any leak around the piston rod, the gland is forced in farther by the bolts and nuts and drives in the sleeve F, which forces the packing D farther into the conical backing ring E, and this packing is thereby forced more tightly against the piston rod. In applying the packing to the piston it is necessary to have the periphery of the packing instead of its interior bear against the joint to be packed; it is also necessary to use two packings for this purpose, one to pack upon the forward stroke of the piston and the other on the backward stroke. The construction adopted in order to achieve these objects will be understood from the drawing, which shows the piston and packing in section.

Hydraulic packing of the design illustrated has been used on a ram 21 in. in diameter at the Pencoyd Iron Works for several months past, the pressure ranging from 1,300 to 3,000 lbs. per square inch, according to the work done. At the same works a bloom shear of the same diameter has been running with water generally so hot that it is barely possible to put the hand on the pipes, and with pressures ranging all the way up to 2,500 lbs. On a hydraulic bridge riveter of 10 in. diameter, averaging from 3,000 to 4,000 rivets in 24 hours, the life of this packing has proved to be six to eight months, under pressures from 1,600 to 2,100 lbs. per square inch. The drawing shows both an internal and external packing, but in the cases above cited only the outside packing was used—that is, where the piston rod formed an extension of the piston and was of the same diameter.

THE WYTHE LEAD AND ZINC MINES, VIRGINIA

Written for the Engineering and Mining Journal by C. B. Boyd.

(Concluded from page 562.)

The ores of these mines were originally sulphides of zinc, lead and iron, occurring in the undecomposed vein matter in a dolomitic gangue, generally 120 to 100 ft. below the surface or crest of the mine hill, the inclosing rocks being the Knox dolomites of No. II., (2), of Rogers' Pennsylvania and Virginia nomenclature. The whole seam, for a length of three miles on the property, is from 15 to 20 ft. between walls of dolomite, in carbonates, silicates and oxides occurring as surface ores over a width of a quarter of a mile by the above length, but more plentifully as you approach Lead Mine Hill from either direction; that is, on the outcrop of the main or Long Hole vein, or, rather, the double outcrop of the folded bed holding the great vein, the northern limb of which only has been mined by underground drifting.

The surface or silico-carbonate ores of zinc are now being mined in distinct masses, along with the brown iron ores, but separated before those iron ores are carried to the two new buddles. These zinc ores are really silicates and carbonates combined and oxides, graduating from pure carbonates on the one hand to pure silicates on the other, with occasional bunches of pure incrustated oxide. Generally they are quite free from lead, which seems to have formed in carbonate and oxide of lead, after its first decomposition, so distinct in form as to be readily detected and removed by the experienced miner. The sulphides of zinc and lead, so abundant below the zone of decomposition, are of course won by the extensive series of long tunnels, drifts and deep shafts on the property. A percentage of blue lead ore is, however, taken in the open cuts which are being driven for all carbonates, silicates and oxides, including iron ore as well as lead and zinc ore.

These open cuts, as well as the tunnels and drifts, are extensive; they represent probably nearly 1,500,000 cubic yards of material removed, which, taken at 5,000 lbs. to the cubic yard, would make nearly 3,375,000 long tons each of rock, earth and ore moved since the beginning of mining operations. The underground work has never been driven more than 40 to 50 ft. below water level of the river close by, and that only for short lengths, where the seam, evidently the northerly fold of the great vein, was 50 to 40 ft. between walls of dolomite. Nearly all the mining now being conducted is open work, is near the crest of the Mine Hill, 250 to 300 ft. above the river, and has been latterly conducted over a width of a quarter of a mile on the outcrops of the north and south folds of the great seam, which has a general direction almost exactly northeast and southwest. The heavier mineralizations appear to show now in about one mile's length of the veins, on the crest of Mine Hill, at no point more than one mile south from New River, on this property; while the whole length of the seam is fully three miles on the property, the river bends approaching them at each end, but preserving the same general elevation above the river. Thus the outcrops are within a mile, except for curvature in locating roads, of the works of the company, which are situated on the south bank of New River, and include motive power and reducing works, in which are dynamos generating electricity for the electric railroad. Here also are the buddles, jigs, pumps, lead furnaces, shops, magnetic ore separators, roasters, zinc reduction works, shothouse, electric railroad and the office, storehouses and other buildings of the company, the shot tower already having been described as a shaft in Mine Hill 241 ft. deep. This space also includes the station (Austinville) and the various tracks of the Norfolk & Western Railway. The general location of the works and mining operations are shown in the map published on page 561.

The open work referred to and some mining by shaft is now in iron and zinc ore principally, no underground work in hard rock for lead

ore being conducted at this time, as the price of lead is down. Zinc ore—carbonate and silico-carbonate—is separated as much as possible in the open cut from the iron ore, and then again at the buddles. The zinc ores which must be crushed are run to the crushers at the river; these are a No. 3 Blake, which will crush 9x13 in.; one pair of Cornish rolls 30 in. diameter and 14 in. face, and one pair of 18 in. diameter and 12 in. face; near them is a log washer for washing both zinc and lead ores after crushing. These ores then pass through three sizing screens, No. 6, No. 3 and No. 2 mm., besides which after crushing there is a ½-in. mesh, all run by a 52-in. Leffel turbine wheel with 6 ft. head of water. There are also at the river works 20 Hart's patent plunger jigs, capacity 80 to 100 tons of ore per day, separating zinc ore from lead ore and gangue, and called on at times to jig sulphides, carbonates and silicates. These jigs and the pump which supplies them with water, a blower, a grist mill, planer and circular saw, derive their motive power from two Leffel turbine wheels respectively 30½ and 52 ins., under 6 ft. head of water.

The zinc ore after this treatment is run by tramway one-fourth mile to sheds adjoining the zinc reducing works. There all zinc ores containing iron are roasted by a patented method, and, after cooling, elevated by a belt and buckets to the magnetic separator which removes the iron ore. The same kind of belting is employed to carry the cleaned zinc ore to bins ready for use in the retorts. By changing a belt the magnetized iron ore, which forms at the rate of three tons per day, is elevated and thrown out, on a level with the track of the Norfolk & Western Railroad, where it is loaded on cars at about \$2.25 per ton, f. o. b.

The fourth of a mile between the jigs and dynamos at the water power and the magnetic concentrator is the length of wire between the dynamo (sending a 20-HP. current) and the magnetic separator and its attendant machinery. This separator was made by C. Q. Payne, New York.

This ingenious arrangement was planned by members of the company, and the whole was erected and put in operation by the active mine manager of the company, Mr. Guy Brawley. The zinc ores are reduced in one block, two furnaces of seven tiers each, containing 140 retorts each, the output being 3,700 to 4,000 lbs. per day, the furnace being heated with Pocahontas coal.

The pug mill for mixing clays and the retort machine in the pot-house are run by a 15-H. P. electric motor, having a capacity of 125 to 100 retorts per day, made by W. W. Woolley, Connorsville, Ind. For condensers, the company finds its own clay on its land ¼ miles to the south of the zinc works.

The company derives a revenue from its brown iron ores, which are now being mined in extensive open cuts on Lead Mine Hill, and cleaned ready for shipment by two large new buddles recently erected on Mine Hill, one of which, 450 ft. south of zinc works and half a mile from the river, is run by electricity; the other, farther south, by steam. The water used in these buddles is pumped to a 200,000-gallon reservoir on Mine Hill, 250 ft. above river level, through a 6-in. cast pipe extending south from the river works one mile in length. The power of the latter is a 66-in. Leffel wheel acting upon a Dean pump, which sends the water at the rate of 400 gallons per minute. The buddle is a 30-ft. double log buddle run by a 35 H. P. Thomson-Houston electric motor, and has a capacity of 60 to 75 tons per day. The second is a steam power buddle, double log, 30 ft., with about the same capacity as the first just mentioned. This iron ore product of 150 to 120 tons per day is sold to the Pulaski Iron Company, Pulaski, Va., at \$2.25 per long ton.

The lead furnaces are three in number, located at the old lead works on the river—the same which were twice destroyed by Federal cavalry in 1864 and 1865. One is a reverberatory for roasting ore; one is an open hearth with 2 tons daily capacity; the third is an open hearth with 3 tons daily capacity. The two latter burn wood and charcoal; the first coal.

The mine transportation is now by means of an electric system constructed by the General Electric Company, under charge of Mr. Geo. R. Mair. The whole arrangement of mine and works is modern and complete.

Petroleum in Java.—The report of United States Consul Ralrden at Batavia says that the Dortsche Petroleum Company commenced operations about the middle of 1888 with a capital of 350,000 florins (\$140,700), and is reputed to have paid last year a dividend of 80%. At Wonokromo, 5½ miles from Sourabaya, it has erected a large refinery, employing some 200 men. The oil is procured at present from wells at a village called Djabakkoto, four miles from Wonokromo, being conveyed to the refinery by pipes. At Djabakkoto there are 27 wells varying in depth from 100 to 800 ft. The density of the oil is 23° to 42°. At another village (Gogor) there are six wells, the deepest being 1,850 ft. There is also a gas well at Gogor with a pressure of 438 lbs. The gas is utilized for stoking purposes. The area of the Dortsche Petroleum Company's concessions in different parts of Java is about 150,000 bahoes (a bahoe is 1¼ acres). Much of the oil is packed in old American cases and sold as American oil.

There is another concession for petroleum—the Goenoeng Sarie—granted by the Government to a Chinese family, the Twan Lok, with a registered capital of 300,000 florins; but they are reputed to have formed a Chinese company with 4,000,000 florins capital. At present this company has an area of 250 bahoes, upon which there are three wells of from 75 to 350 ft. deep. The well of 75 ft. depth discharges 396,000 liters in 24 hours, the oil having a density of 17°. This company has been working for only a few months, and anticipates putting in a plant of sufficient capacity to deliver 100,000 liters per month. Labor is cheap. The labor cost per foot for sinking the wells averages 1 florin for the first 150 ft. Twelve wells are being put down near Pasverolan, Kedirie, Toebang, Rembang and Banjoewangie, concessions having been granted and companies formed for petroleum. There is a good field for American oil machinery, of which nothing is known.

SOME ALABAMA IRON NOTES.

Written for the Engineering and Mining Journal by Dr. W. B. Phillips.

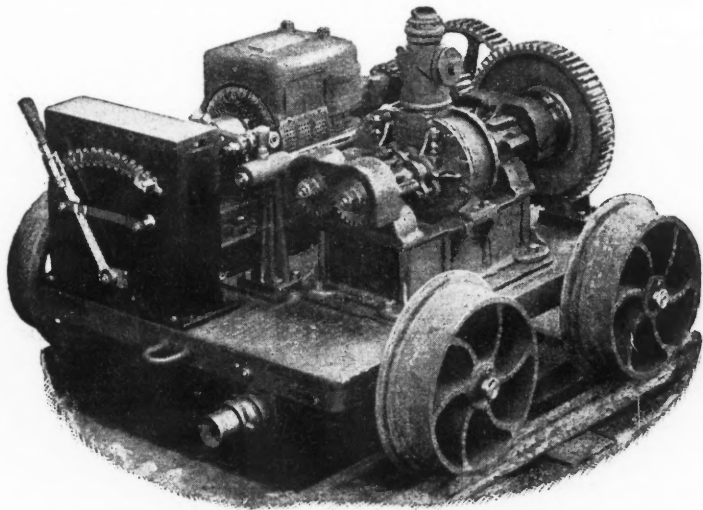
There is more or less said about the depression in the iron trade, but the furnaces now idle here are two Alice, one Oxmoor, Mary Pratt, Vanderbilt, two Bessemer, one Ensley and Williamson. In blast are four Sloss, two Woodward, one Oxmoor, four Bessemer (and another to go in shortly), two Pioneer (Thomas) and three Ensley. One does not risk too much in saying that iron is now made in the Birmingham district for \$2 per ton less than it cost in 1890-1891, and that a further reduction could be made without closing any furnace now in blast.

Southern iron men have been blamed for reducing the price of iron unnecessarily, and it has been said that they are now suffering the effect of their own hasty and ill-advised course. All this may be true, but the fact remains that they have a fair share of the trade and are in no worse plight than their competitors. It is quite possible that they can stand reductions that would close other furnaces not so well situated.

What Southern iron men are doing is to inquire closely into every proposition looking toward a reduction in the cost of production and an increase in the quality of the iron. By more careful mining of the coal, by washing the coal before it is coked, by disintegrating the coal, by using larger proportions of brown ore, by critical inquiry into the possibilities of concentrating or otherwise improving the iron ores which are the great mainstay of the enterprise, the red fossil ores, they are striving to brighten the future.

AN ELECTRIC MINE PUMP.

The illustration herewith represents a special mine pump operated by electric power and manufactured by the Jeffrey Manufacturing Company of Columbus, O. In the equipment of mines with the Jeffrey



THE JEFFREY ELECTRIC MINE PUMP.

electric machinery this pump has been found very efficient, and is especially desirable for pumping water in and about mines having dipping entries or rooms. The pump and motor are mounted on a truck which enables it to be moved around the mines with ease. The pump is of a rotary type and is connected with motor by proper gears. The motor is encased, so that it is well protected and is usually wound for 220 volts, but can be wound to suit parties ordering. The suction in the illustration is shown at the base of the truck, while the discharge at the head of the pump. The whole forms a very neat and convenient arrangement.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of Florida.

Ownership of Deposits of Phosphate in State.

Where the statutes relating to the phosphate interests of the State assert an absolute right of property upon the part of the State in the phosphates lying in the beds of her navigable waters, and the exclusive dominion of the State over the same, the theory and policy are inconsistent with a property right or ownership therein by others, either under the riparian act or otherwise.—Peruvian Phosphate Company versus Board of Phosphate Commissioners, April 18th, 1893. 12 South. Rep., 913.

United States Circuit Court of Appeals, Eighth Circuit.

Ejectment to Recover Mining Grounds.

In an action of ejectment, a reviewing court cannot consider or make computations upon a map which is merely introduced by counsel in argument, but is not made a part of the record. In an action of ejectment to recover certain grounds, as between the owners of adjoining claims, one of the issues made by the pleadings was as to the point at which the vein passed out of the side line of one claim and into the other, but at the trial this issue was not pressed, and the court, with the acquiescence of counsel, charged the jury that plaintiff claimed 600 ft. along the vein, and that the parties had apparently submitted that the case should be determined upon the point whether there was not

one broad vein, having an outcrop in both locations. A recovery was had of the 600 ft. Defendant was estopped from claiming on writ of error that the recovery was for more than was warranted by the evidence relating to the exact point at which the vein crossed the boundary line between the claims. It appeared in such case that the vein in its dip passed through the side lines of plaintiff's claim into defendant's claim; the fact that the jury failed to find the exact depth at which the vein crossed the line was no ground for reversal, since the question of ownership and possession, which was the only one in issue, depended entirely upon the location and width of the apex of the vein. When the apex of a vein passes out of the side line of a claim into an adjoining claim, the latter, though junior in date, gives to the owner the right to follow the vein in its dip underneath the senior claim.

Colorado Central Consolidated Mining Company vs. Turch, 54 Fed. Rep. 262.

United States Circuit Court, Southern District of California.
Right to Follow Dip in Mining Claim.

The patentee, and even the mere possessor of a mining claim, under license from the Government, has a right to all minerals lying vertically beneath the surface of his claim, subject only to the right of the lawful possessor of a neighboring claim having parallel end lines to follow any lode, the apex of which lies within his claim, on its dip within the limits of infinite planes projected through such end lines. An unlawful possessor has no such right to follow the dip. Where the end lines of a surface location of mining lands, as fixed and declared in the Government patent, are parallel, the patentee's right to follow the dip beyond his side lines cannot be defeated by showing that in the original location of the claim the end lines were not parallel. The patent while unrevoked is conclusive on this point. The patentee's right to follow the dip exists by virtue of the statutes whether the express grant of such right is contained in the patent or not.—Doe versus Waterloo Mining Company, March 27th, 1893. 54 Fed. Rep., 935.

Priority of Conflicting Claims in Mines.

Where one discovered a metal-bearing lode, and on the same day erected a monument and posted a notice stating that he had "this day located and claimed" for mining purposes 1,000 ft. northwesterly and 500 ft. southeasterly therefrom, with 300 ft. on each side, and claiming 20 days within which to complete his boundary monuments, eleven days thereafter other prospectors located and set up the boundary monuments of a conflicting claim, and in so doing saw the notice at a distance of 150 ft., but did not take the trouble to go and read it. Subsequently, but before the expiration of the 20 days, transferees of part of the interest of the first claimant (who was prevented from doing so himself by sickness) set up the boundary monuments of his claim. In the absence of State statutes or mining rules fixing the time within which the exterior boundaries should be marked, 20 days was a reasonable time, and that he was entitled to a patent as against the subsequent locators.—Doe versus Waterloo Mining Company, April 3d, 1893. 55 Fed. Rep., 11.

Petroleum in Peru.—The most successful wells are those at Zorritos, which is about 20 miles south of the Tumbes River. There are between 30 and 40 at this point, and at least twenty of these yield oil. Mr. Piaggio has a refinery there with three stills, condensers, tin shop, barrel sheds and all the machinery and apparatus necessary for refining the crude petroleum. Sailing vessels carry away the product, which is sold along the whole west coast, and the oil is accounted much better and commands a higher price than that from the wells at Talara. The petroleum is without paraffine, carries benzine in great abundance, and yields but about 30% of kerosene or illuminating oil.

PATENTS PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING JUNE 10TH, 1893.

- 10,037 of 1892. Coal Washing and Sizing Plant. A. Kesson, D. Campbell, S. Potts and W. Reid, Hamilton, Scotland.
- 11,440 of 1892. Miners' Safety Lamps. T. Morris, Birmingham.
- 12,977 of 1892. Electrolytic Soda and Bleach. Dr. C. A. Burghardt, Manchester.
- 12,983 of 1892. Manufacture of Ferric Chloride. J. H. Kidd, Manchester.
- 13,103 of 1892. Apparatus for Evaporating Chemical Solutions. F. W. Scott and F. W. Scott, Jr., London, and G. G. Scott, Liverpool.
- 13,121 of 1892. Recovering Zinc from Residues. E. H. Cook and A. E. Petter, Bristol.
- 13,838 of 1892. Coal Cutting Machines. A. Greenwood, Leeds.
- 17,827 of 1892. Classing Pulverized Ores by Air Currents. G. Henoch, Gotha, Germany, and E. M. C. Exelmans, Paris.
- 5,214 of 1893. Safety Lock for Miners' Lamps. O. Hawkins, Treharris, S. Wales.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, JUNE 20TH, 1893.

- 499,705. Grinding Machine for Metals. William Bright, Sheffield, England.
- 499,713. Flexible Tubing. Gotthard Commichan, Magdeburg-Sudenburg, Germany.
- 499,715. Process of Burring Fuel. Eckley B. Coxe, Drifton, Pa.
- 499,716. Furnace. Eckley B. Coxe, Drifton, Pa.
- 499,720. Hydrocarbon Burner. Joseph Darby, Springfield, O., Assignor of one-fourth to Eliab F. Darby, same place.
- 499,732. Metal Bending and Twisting Machine. John C. Herman, St. Louis, Mo., Assignor to the American Nutlock Company, same place.
- 499,739. Method of Testing Rolled or Forged Metals. Alfred E. Hunt, Pittsburg, Pa.
- 499,816. Steam Generator. Harry L. Wilson, Erie, Pa.
- 499,915. Separator. John M. Finch, Marysville, Cal.
- 499,919. Adjustable Wrench. Willard H. Griffin and Elmer P. Nichols, Henniker, N. H.
- 499,964. Electric Bath Metal-Heating Apparatus and Process. George D. Burton, Boston, and Edwin E. Angell, Somerville, Mass., Assignors to the Electrical Forging Company, of Maine.
- 499,968. Hydrocarbon Burner. William H. Clarke, Brooklyn, Assignor of one-half to Gustavus Isaacs, New York, N. Y.
- 500,022. Electric Road Vehicle. Jehn W. Moakler, Denver, Colo. Assignor of one-half to Horace E. Henwood, Kansas City, Mo.
- 500,108. Wire Rolling Mill. Henry A. Williams, Taunton, Mass.

PERSONALS.

Prof. Arthur Lakes, of the Colorado School of Mines, is in New York, and sails June 24th for England, where he intends to spend part of his vacation.

Mr. Victor M. Clement, formerly superintendent of the Bunker Hill & Sullivan Mining Company, has accepted a professional engagement in South Africa, for which country he will leave early in July.

Mr. Chas. Wade Stickney, mining engineer, late of Butte, Mont., has been appointed general manager of the Phi Kappa Mining Company, Limited, of London. His headquarters will be temporarily at Ketchum, Idaho.

Dr. E. D. Peters, Jr., the well known mining engineer, who has been examining the copper mines of Tasmania, will leave that country about July 15th. He will return by way of Italy, Spain, France and England, spending some time in each of those countries.

Mr. A. L. Walker has resigned his position as superintendent of the Old Dominion Copper Company, at Globe, Ariz., and has been appointed general manager of the Baltimore Electric Refining Company, Baltimore, Md. He will also act as consulting engineer of the Old Dominion Company.

The Governor of Pennsylvania has appointed Bernard Callaghan, of West Leisenring, in Westmoreland County, and Roger Hampson, of Harrod, in Elk County, mine inspectors for the ninth and tenth districts, respectively, of the bituminous coal region. These are new appointments, the number of inspectors having been increased from eight to ten, by an act of the last legislature.

Mr. Reese, who some time ago resigned the superintendency of the Susquehanna Coal Company, at Nanticoke, Pa., to assume charge of the Stevens colliery, in West Pittston, Pa., has tendered his resignation to the latter company to take effect July 1st. Mr. Reese will return to Nanticoke to assume the position of inside superintendent of the Susquehanna Coal Company's mines, a position which he filled before going to Pittston.

OBITUARY.

Prof. M. H. Calkins, formerly of the School of Mines at Rapid City, South Dakota, died in Cripple Creek, Colo., June 14th.

George T. Utley, who died in Hartford, Conn., June 19th, aged 48 years, had been for 20 years secretary to the State Railroad Commission. Few men knew more of Connecticut railroads.

Josiah Robbins, who died at Sharpsville, Pa., June 14th, was one of the best known ironmen of Western Pennsylvania. For some years past he had been superintendent of the Claire Furnace Company, at Sharpsville.

Joseph Wertin, Sr., who died in Hancock, Mich., June 11th, aged 75 years, was one of the pioneers of the Lake Superior region, having settled in Hancock in 1861 and established a general mercantile business there. He was one of the promoters and chief stockholders of the Grand Portage Mining Company.

James Parks, the "father of the Pan Handle," died at Stenbenville, O., on June 19th, aged 87 years. He was one of the promoters of the special act of the General Assembly in 1848, chartering the Stenbenville & Indiana Railroad, which passed through different organizations into what to-day is the connecting link of the Pittsburg, Cincinnati & St. Louis Railroad Company. He was a Pan Handle director for 34 years, and for 15 years was the only living original director, retiring a poor man.

Patrick J. Flynn, who died in Los Angeles, Cal., June 1st, had been actively engaged in the profession for 35 years. He spent eight years in India, and for 14 years was connected with city engineering works in San Francisco, and later in Los Angeles. He was the author of a book on irrigation, to which branch of engineering he had devoted special attention; this book is one of the best published on the subject. He was a member of the Technical Society of the Pacific Coast and of the American Society of Civil Engineers.

Walter McQueen, who died in Schenectady, N. Y., June 16th, was for over 30 years superintendent of the Schenectady Locomotive Works. He was the last survivor of the group of able mechanics—Baldwin, Hudson, Norris, Swinburne, Thomas Rogers and William Mason—who made the American locomotive what it is to-day, and none of them, with the possible exception of William Mason, surpassed Mr. McQueen in ability as a designer or readiness in adaptation. He retired from active service several years ago in consequence of age and failing health, but retained a considerable interest in the works.

Leland Stanford, who died at Palo Alto, Cal., June 21st, aged 69 years, had served as Governor of his State and United States Senator, and was the first president of the Central Pacific Railroad Company. He was born near Albany, N. Y., and studied law, but in 1852 went to California and

entered into business. For some time past he has been in failing health, and it is possible that his mind has been affected, a supposition which would explain his advocacy in the senate of some extraordinary financial vagaries, the fallacy of which must have been apparent at once to a clear-headed business man such as he had shown himself to be. Senator Stanford left a very large fortune, variously estimated at \$30,000,000 to \$50,000,000, a large part of which will go to the University which he founded in memory of his only son.

SOCIETIES AND TECHNICAL SCHOOLS

Association of Engineers of Virginia.—The summer meeting will be held June 30th and July 1st, at the Hotel Rockledge, on Mill Mountain, 2½ miles from Roanoke, Va.

Colorado School of Mines.—Prof. M. C. Hilseng, of this school, at Golden, Colo., accompanied by a party of 20 students, has been visiting the copper mines of the Upper Peninsula of Michigan. They inspected the mines and mills about Hancock and Calumet last week.

University of Illinois.—This university has provided in its engineering college a special course of mining engineering, which has already attracted a number of students. Especial attention is given to mine surveying, the principles of mine ventilation and similar work having especial bearing on the management of the coal mines which are the chief mineral resource of the State.

American Association for the Advancement of Science.—The forty-second meeting will be held in Madison, Wis., beginning with a meeting of the council on August 16th. The first general session will be held on Thursday, August 17th, and the meeting is expected to continue until August 23d. Meetings of the affiliated societies, including the Geological Society of America, will be held at the same time. Members who wish to attend the meeting are requested, for all matters relating to local arrangements, hotels, railway rates and certificates, to address Prof. C. R. Barnes, local secretary, University of Wisconsin, Madison, Wis.

Engineers' Club of Cincinnati.—At the last regular meeting Mr. W. B. Ruggles read a paper on "Building Stones of the Vicinity of Cincinnati," which contained much of interest and value in information and statistics in reference to the quality and characteristics of the stones found in the quarries within a radius of 100 miles or more from Cincinnati, and of the various uses to which they had been put and were adopted. Mr. J. H. Lawton, who had been connected with the work, gave an interesting account of the construction of the Niagara Falls tunnel, which was built as a part of the plant of the Niagara Falls Power Company and the Cataract Construction Company, for the utilization of the Falls for the development of hydraulic power for industrial purposes.

American Boiler Manufacturers' Association.—The annual meeting was held in Chicago, June 13th to 16th. At the opening session the president, Col. Philip Rohan, of St. Louis, made an address congratulating the members present on the prosperity of the association. Routine business occupied the remainder of the morning. In the afternoon, the regular business was suspended and several papers were read on the advisability of urging legislative action in regard to securing a more uniform system of boiler inspection. Also to obtain if possible the approval of the United States Government of the brand of steel plate known as "A. B. M. A." steel. A resolution was carried after some discussion to the effect that all members should endeavor to influence every purchaser of a new boiler to consent to the use of A. B. M. A. steel plate and report on the results of his efforts at the next annual meeting which will be held at Boston, Mass., July, 1893. A portion of the time was devoted to a discussion of hours and wages of boiler makers; this session was held with closed doors, when several representatives from the boiler-makers' union addressed the association on behalf of the men. A banquet was tendered the visiting members of the association, and on Wednesday evening, June 14th, some 170 partook of an excellent menu in Corinthian Hall. A visit to the Worlds' Fair was made.

The election of officers for the ensuing year resulted in the selection of John Mohs, Chicago, president; H. S. Robinson, vice-president; S. D. Meier, St. Louis, secretary; R. Hammond, Buffalo, treasurer. The retiring president, Col. Phil. Rohan, was presented with a handsome gold-headed cane.

Montana Society of Civil Engineers.—The regular monthly meeting was held at the office of Messrs. Sizer & Keerl, in Helena, June 10th. Henry C. Relf was elected to membership. Messrs. Cumming, McRae and Foss were appointed a committee to see if any arrangements could be made with the heirs of Col. W. W. DeLacey, late president of the Society, by which his library of engineering works could be secured by the Society. The Society then proceeded to discuss the question of manufacturing industries in Montana. Mr. Cumming stated that the barley straw raised in the Gallatin Valley was particularly adapted to the manufacture of paper, and it was understood that a paper mill was soon to be erected at Manhattan. At present most of the straw raised by the Manhattan company is burned. Mr. Foss inquired if

flax had ever been raised in the Gallatin Valley, and Mr. Cumming stated that it had and that it grew wild in some portions of the valley. He could see no reason why a linseed oil factory could not be made a commercial success. The manufacture of sugar from the sugar beet was also mentioned as a probable industry of the future. Mr. Herron stated that large deposits of iron ore existed in the vicinity of Great Falls, and other deposits were mentioned by different members. Mr. McNeil said that he understood the chief difficulty to be encountered in manufacturing pig iron in Montana was the quality of coal required for furnace use. If Montana coal could be successfully used in blast furnaces there was no reason why Montana should not produce iron and numerous allied industries be established. Mr. Cumming thought that lead pipe and shot should be manufactured here. The smelting works produce large quantities of silver lead bullion; there seems to be no good reason why the bullion should not be refined here and the lead used in some manufactory. After a further discussion on the electrical transmission of power, and a need of a further development of the agricultural resources of the state, the Society adjourned.

INDUSTRIAL NOTES

Pulaski Furnace at Pulaski, Va., went into blast again June 12th.

It is reported that the Cherokee Iron Company has sold its furnace at Cedartown, Ga., and that it will soon be started up.

The Bosworth Machinery Company has been incorporated at Cleveland, O., to manufacture and deal in machinery of all kinds.

The machinery of the New Albany, Ind., rail mill is being removed to the new mills at Alexandria, Ind., and erected there.

The American Steel Wheel Co. has completed its plant at Garwood, N. J., and is now ready to fill orders for wheels and steel castings.

The Robinson-Rea Manufacturing Company, Pittsburg, Pa., is building a new foundry 200 x 143 ft., to replace one recently destroyed by fire.

The Pottsville Iron and Steel Company, Pottsville, Pa., is building a new hammer shop for the Baldwin Locomotive Works, in Philadelphia. The building is 50 x 200 ft., entirely of iron.

The Lunkenheimer Company, of Cincinnati, issued a handsome card with a view of Machinery Hall, at Chicago, and directions to the visitor to the exhibit, which is in Section 25, Column O-24.

The Leisenring Manufacturing Company, of Scranton, Pa., has been incorporated, with the capital stock placed at \$12,000, for the manufacture of iron, steel, etc. W. H. Watson, of Erie, Pa., is one of the incorporators.

The Pittsburg Architectural Iron Works was granted a charter last week. The capital stock is \$150,000, and is held by John A. Butz, G. C. Delenbach, William Eberhardt, of Allegheny; William B. Neal, Pittsburg, and H. P. Butz, Uniontown.

The Appalachian Steel and Iron Company, at Big Stone Gap, Va., has made an assignment. The capital stock is \$150,000. The company owns two blast furnaces, each 75 ft. high and 18 ft. bosh, with a capacity of 60,000 tons of pig iron yearly.

The Defiance Machine Works, Defiance, O., shows in its new catalogue a great variety of power transmission machinery, including pulleys, hangers and bearings of different styles, couplings, pillow blocks and similar devices. The catalogue is handsomely illustrated.

At a recent meeting of the directors of the Sheffield (Ala.) Land, Iron and Coal Company, the following officers were elected: Charles Sykes, president; W. S. Settle, vice-president; W. H. Mitchell, secretary and treasurer. This company owns valuable property in and around Sheffield, Ala., and is free from debt.

The business heretofore carried on at Erie, Pa., under the name of the Erie Engine Works, Cleveland & Hardwick, proprietors, has been incorporated under the laws of the State of Pennsylvania, taking effect June 2d, 1893, and will hereafter be known as Erie Engine Works. William Hardwick, president; F. F. Cleveland, secretary and treasurer.

In a letter published on page 460 of our issue for May 20th, it was stated that the Grusonwerk, of Magdeburg-Buckau, Germany, had the sole right to manufacture the Bilharz percussion tables. Mr. O. M. Bilharz, son of Oberberggrath Bilharz, the inventor, informs us that while this statement is correct so far as it relates to European countries, Mexico and the Transvaal, the right to manufacture these machines in the United States is owned by the Chicago Iron Works.

An assignment has been declared by the General Engineering Company, of Harvey, Ill., and the American Loan and Trust Bank has been appointed receiver of the concern. The stringent condition of the money market is given as the cause of the failure. The attorneys say that the liabilities, mostly claims of Wheeling, W. Va., banks, are in the neighborhood of \$75,000. The assets, as re-

ported by John M. Sweeney, president of the concern amount to \$225,000.

The C. W. Hunt Company, New York, have issued, in connection with their exhibit at Chicago, a pamphlet giving a list of the articles shown in their space in the Transportation Building, and also a handsomely illustrated pamphlet descriptive of their system of industrial railroads, with a list of a number of prominent manufacturers and others who use that system. The advantages claimed for this are sufficiently well known to require little further description, but it may be said that the pamphlet gives all of the information required.

The latest catalogue of the Link-Belt Machinery Company shows the different forms of the Ewart detachable link belting, the wheels for carrying it and a number of forms of special chains for transferring machinery and other purposes. The company has also issued a handsome album, containing photographs of machinery erected on its plans, which are selected from a large number in its possession. The views include a locomotive coaling station, inclined conveyors, several coal storage plants, barrel elevators of two or three different designs, barrel conveyors, horizontal and inclined box conveyors, conveyors both horizontal and inclined for general freight and for ice, coal unloading and re-loading plants and finally rope power transmissions for dynamos and other purposes. One of the photographs shows the coal storage plant of the Delaware & Hudson Canal Company, at Rondout, which has a capacity of 120,000 tons and is one of the largest plants of the kind in existence. It may be added that the photographs are of unusual excellence.

The Sturtevant Mill Company, of Boston, Mass., has made a decided advance in the art of grinding by the use of stones. This improvement consists in substituting for the stones in ordinary use grinders made from rock emery, which is peculiarly adapted to this purpose. In hardness it is only excelled by the diamond, and its cutting power is unexcelled. An emery face is always sharp, it never glazes or polishes, and cuts with an unexampled rapidity every substance known. It is not a common mineral, being found in but few countries. The best comes from Greece, but the large importations are from Turkey. Millstones made of rock emery are now an accomplished fact, and a long step has thus been taken toward a cheaper pulverization of hard substances that heretofore have only been reduced at much expense of wear and tear, by slow and tedious processes. They can reduce all materials to any degree of fineness, and are rapidly coming into general use. The ability of these stones to run cool is a valuable feature developed, and they are as much more durable than other millstones as they surpass them in hardness. The face of a rock emery millstone never needs dressing, as a little work on the furrows and eye (made of softer material) is all the sharpening they require. They are made to take the place of all other millstones without any changes in the mills. Wherever other stones are used the rock emery millstones will do better work, at less expense, and last much longer. They grind hard materials that would destroy all other stones. These millstones are sold at a moderate price, and are now running successfully in many places.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

ALABAMA.

It is stated that the Gulf, Colorado & Santa Fe Railroad has made contracts for 50,000 tons of Alabama coal annually, and local dealers in Galveston, Tex., have ordered nearly 20,000 tons more. The coal will be mined near Birmingham, and shipped to Galveston by way of Mobile in barges. This will necessitate the construction of a steam elevator, and parties have been dispatched from Galveston to New York to purchase a plant.

ALASKA.

Alaska Treadwell Mining Company.—This company has declared an extra dividend of 37½¢ per share, aggregating \$75,000, which was payable on the 12th inst. This was in addition to the regular quarterly dividend of the same amount.

ARIZONA.

Yavapai County.

Castle Creek Mining District.—Free gold ores are being found in this district. The veins are fissure veins with oxidized quartz ores. The water level is found at 250 ft. Arrastres and stamp mills are used for reduction. One of the drawbacks of mining in this region is the scarcity of

timber. Wood is now sold for \$6 per cord, as the supply is limited.

CALIFORNIA.

The rumor that a large quantity of Japanese coal had been contracted for, to be delivered in San Francisco, is contradicted by San Francisco coal merchants, who state that the large tonnage, amounting to 100,000 tons for the first year and 300,000 tons for the succeeding years, cannot be furnished by Japanese mines. But as some of the Japanese coal mines are constantly increasing their production we see no reason why this amount of coal could not be supplied from Japan. Of course, the main question is the cost of freight and the original value of the coal as compared with New South Wales, British Columbia or Washington.

Amador County.

Woodbridge.—This property near Clinton is said to be looking well. The tunnel has been run on the ledge for about 58 ft., exposing 4 ft. of good grade ore.

Boulder County.

Magnolia Mining and Milling Company.—In the main tunnel from the shaft at a distance of 300 ft. the Tybo vein was cut, 15 ft. wide. At 250 ft. 3½ ft. of smelting ore was cut. It is thought that a mill will be erected before long.

Chaffee County.

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

Little work is going on at the present time owing to the condition of the roads; the Pat Murphy Mining Company now working under a lease has a pay streak of 6 ft. of medium grade ore. The lessees are opening up new ground for stoping. Many prospectors are at work in the camp, and now that the Chalk Creek Valley has facilities for concentrating low grade ore there are likely to be some good mines opened up. Mills with a capacity of 200 tons daily are now in this region and with the large showing in the mines it is reasonable to think that the season will be a successful one.

Nevada County.

Brunswick Consolidated Gold Mining Company.—The superintendent of this company writes as follows under date of June 14th: Work has been going on steadily in the mine for the past week. In the 700 level we have a formation of 18-in. stringers of quartz and cab. Some of the stringers show gold and from the way they look should soon make a solid ledge. The 600 raise shows gold and sulphurets, but the gold is very fine.

South Idaho.—Some rich ore has been struck in this property recently.

Sierra County.

The property belonging to the following mining companies is advertised for sale, owing to the delinquent taxes: Golden Era Mining Company, Indian Queen Mining Company, Mt. Diablo Mining Company, Suffolk Drift Mining Company, Wadlington Mining Company, Eclipse Gold Mining Company, Oriental Gold Placer Mining Company, American Hill Hydraulic Mining Company, Bunker Hill Gold Mining Company, General Grant Quartz Mining Company, Mascot Gold Mining Company, Nichols Mining Company, Red Chief Mining Company, Comet Mining Company, Ships Mining Company, Garabaldi Quartz Mining Company, Gold Clips Mining Company, Gold Lake Mining Company, Mountaineer Gold Mining Company, Mining Investment Company, Phoenix Gold Quartz Mining Company, Young America Consolidated Mining Company. Of these companies the Mascot, Red Chief, Gold Lake Mining and Investment, Phoenix Gold Quartz and Young America Consolidated Mining companies have mills.

Comet Consolidated.—Development work on this property will be commenced in a short time.

Excelsior Drift Gravel.—Gravel from this property is paying \$4.50 a car load. It is thought to be on the upper portion of the Howland Flat Channel.

Tnolunne County.

Martha Washington Placer Mining Company.—This company, which is owned by Oakland ladies, has 700 acres of placer ground near Chinese Camp. A 75 ft. bank of gravel is now being hydraulicked, and a Bennett amalgamator has been secured which the company will operate in addition. A tunnel 1,000 ft. long has been driven to tap the old mountain channel; this has cut gravel prospecting well.

Yuba County.

Forlorn Hope.—An attempt is being made to place this old mine in San Francisco. It has not been worked for many years.

COLORADO.

El Paso County.

It is said that the success of the cyanide process on the ores at Cripple Creek has been impaired by the difficulty in leaching, they being impervious to the solution.

Victor Gold Mining Company.—Mr. W. H. Cone, a well known mining man of Colorado, writes as follows concerning this company's property: There is a good, strong vein in the bottom of the shaft 3 ft. wide which runs about 20 oz. per ton in gold (or \$400), and there is no question when you drift on that ground you will have as good ore as above, and more of it. I think the vein in lower levels is straightening up very much. Things around the mine are in good shape, and the ore is carefully taken down. Mr. William Trovorrow,

superintendent of the mine, writes June 11th, as follows: 'We have our new hoisting works up; got it to work Friday. We have connected levels Nos. 1 and 2 west by an upraise which gives us good ventilation in that part of the mine. On No. 3 west we supply air until upraise is through from No. 3 to 2. The shaft is now down 90 ft. below third level and will be down 100 ft. by the last of the week. The vein in the bottom of the shaft is looking well. The East drift is also looking first rate. The last 42 car loads shipped to the smelter averaged \$196.11 per ton, the last two car loads run \$205.86 per ton in gold. This is over and above freight and smelter charges, the net amount that the smelter pays for the ore.'

Gilpin County.

California Mining and Milling Company.—This company is a reorganization of the New California Mining Company, Limited, an English syndicate having purchased the property of that company, including the 75-stamp mill. Mr. Alfred Rickard will be retained as manager.

Rawlings Gold and Silver Mining Company.—This company has been purchased by a syndicate on a basis of \$400,000, \$50,000 down and the balance within two years. Development work will be begun under the direction of Mr. Philip Ardall.

Running Lode.—Ten stamps are kept continuously running on this property and 60 tons of smelting ore are shipped monthly. This smelting ore averages \$80 a ton. The vein varies from 15 in. to 2 ft. wide.

Lake County.

(From our Special Correspondent.)

El Paso.—These people are still pumping, but within two weeks expect to have their shaft drained when sinking will at once be resumed on this ground, which has been leased by the Union Mining and Leasing Company. In order to prevent future water trouble another pump capable of handling 10,000 gallons of water per minute is now on the ground.

Gazelle.—Work on a new shaft has been commenced and a first-class plant is to be placed on the property.

Holden Smelter.—There are three stacks now in operation and 700 tons of slag and ore can be handled daily. These people have a contract lease on the old La Plata dump, where there are nearly 300,000 tons of slag to handle.

Huckleberry.—The main tunnel is in 300 ft. from the incline and right at this point a fine body of ore was unexpectedly met with. This is good milling stuff, running well in silver and will be handled by the new Huckleberry mill.

Maid and Henrietta.—The water in the Maid shaft is now held at the 750-ft. level, which means a rise of 170 ft. It was while cutting the big station in the bottom of the shaft that this new water course was encountered, and it rose with great rapidity. A new pump is being placed in position.

Pawncos.—The main drift is being pushed ahead rapidly. It is the intention also to follow up the rich streak of ore encountered some time ago in an upraise and which gave some very rich assays.

Bison.—This is an entirely new working which has just been started. This shaft is to catch the second contact ore chute below the Penderly fault.

Treatment of Sulphides.—A great deal of discussion has taken place here among mining and smelting men as to the best method for treating sulphides produced by lixiviation processes. It has been the general custom to sell the sulphides to the large general refineries, where they were melted satisfactory. The latest process for the treatment of lixiviation sulphides is one owned by an Eastern company, and adopted at some of the lixiviation works in Utah. This process has been carefully looked into by a number of Leadville mining men, and the question is now being discussed as to the feasibility of its introduction here.

San Miguel County.

Silver Bell Mining Company.—This property is said to be looking in good condition. The ore is richer than previously and large bodies are being developed. Some ore has already been shipped and preparations are being made to export large quantities.

FLORIDA.

Suwannee County.

Ocala & Blue River Phosphate Company.—The improvements in the plant are nearly finished, and the company will soon start up with a capacity of 150 tons a day. To this will shortly be added eight new log washers.

GEORGIA.

Lumpkin County.

Chestatee Gold Mining Company.—Mr. John M. Brooksher has been appointed receiver on suit of the Bucyrus Steam Shovel and Dredge Company, holding a judgment for \$6,000 for machinery furnished. Other judgments to the amount of \$4,000 have been filed.

IDAHO.

Alturas County.

Red Cloud.—This mine has been drained of water and both sinking and stoping of ore will be resumed. Mr. Orin Porter has sold his interest in this property to Mr. Lyttleton Price, the superintendent.

Owyhee County.

Chariot Group.—It is stated that an organization of this with the South Sinker tunnel and mill site will be effected. These properties have not been worked for a long time but they are supposed to have a considerable quantity of low grade ore in them.

Foreman Mines, Limited.—The Oso tunnel is now in 1,700 ft. and is being run on the vein as rapidly as possible; the face of the Bonanza Shoot of ore which has been opened up at the 150 ft., showing from 1 to 3 ft. of high grade ore.

KANSAS.

A conference between the coal operators and the striking coal miners held at Pittsburg, Kan., June 22d, failed to result in any agreement. The strike of the coal miners will continue and there are threats of extending it to western Missouri and the Indian Territory. The further stoppage of the output of coal will embarrass the zinc and lead mines of western Missouri and Kansas to a considerable extent.

MINNESOTA.

Iron—Mesaba Range.

Several of the mines on this range have been surrounded by forest fires and the mining towns destroyed. According to press dispatches the latest reports from the burned towns of the range indicate a much greater financial loss than was believed. At Virginia the loss will foot up nearly \$1,000,000 and other places, including mining camps and machinery, towns and bridges, fully \$500,000. The loss to standing timber cannot now be estimated as the fires are still burning, but it is feared that it will amount to another \$1,000,000 or more. The mining camps in the vicinity of Virginia are inaccessible on account of the surrounding fires, and it is believed that the camps of the Mesaba Mountain mine, Great Northern, Moose, Commodore and one or two others are destroyed, together with mining machinery. This will delay ore shipments considerably. The bridges on the Duluth & Iron Range, between Ely and Tower, have been burned, thus considerably curtailing the output of the Vermilion range.

(From our Special Correspondent.)

The Ohio Ore Company, operating the Ohio mine in 58, 17, will begin shipping in July, and state that they will be prepared to deliver to the railway 150,000 tons of Bessemer ore this year.

It is not probable that the immense new docks of the Duluth, Missabe & Northern road will be ready to handle ore much before August 1st.

Biwabic Ore Company.—This company, operating the Biwabic mine in 58, 16, shipped its first ore last week. This was a notable event, for it was, so far as known, the first time iron ore had ever been raised, in the Lake Superior district, at least from its original bed with a steam shovel, without previous blasting or loosening. Some 500 tons were sent out and the ore was handled by the shovels easier than the gravel above it. This company has spent \$100,000 in stripping the surface and mixed ore off the ore body.

Hale.—This mine in 58, 16, has been equipped with overhead cable conveyors and is ready to ship. Its superintendent claims to be able to load 300 tons daily with an average force of 30 men, after the stripping is completed and a central cut is made through the exposed ore body.

Mahoning Ore Company.—Officers of the Mahoning Valley Iron Company, the Andrews Brothers Furnace Company, and the Andrews-Hitchcock Iron Company have organized the Mahoning Ore Company to operate tracts in 58, 17, on which ore has been discovered. These lands are owned by Wright & Davis, heavy Duluth lumbermen.

Minnewas.—This mine, owned and operated by the Biwabic company, shipped its first cargo east the same week, 3,000 tons. It is an underground mine and is equipped to handle 250 to 300 tons daily.

Standard Ore Company.—This company, operating the Cincinnati mine in 3, 58, 16, has made another proposition for a reduction of royalty, asking that the net royalty paid the Cincinnati be made 20 cents a ton. It is now 25 to 30 cents on different portions of the mine. The Cincinnati pays 25 and 30, also to the owners of the fee, but they have already agreed to a reduction of 5 cents. It is probable that the proposed reduction will be granted for a time.

Iron—Vermilion Range.

(From our Special Correspondent.)

Minnesota Iron Company.—This company held its annual meeting in Duluth, June 12th, and the old directors were re-elected. It is understood the company will declare 6% in dividends on the year's operations. It has so far paid \$2,100,000 in dividends.

MONTANA.

Deer Lodge County.

Puritan Mining Company.—The good showing on the 300-ft. level has determined this company to sink 200 ft. further. Meantime, development on the 300 level will still go on.

Jefferson County.

Elkhorn Mining Company.—The monthly return shows that in May the mill worked 28 days and crushed 1,018 tons. The receipts were: Bullion produced, \$29,825; smelting ore sold, 377 tons, \$19,700; total, \$49,525. The expenses were \$24,800,

leaving the profit for the month \$24,725. An interim dividend of 1s. 6d. per share, for the three months ending May 31st, has been declared.

Silver Bow County.

(Reported for the "Engineering and Mining Journal.")
Anaconda Mining Company.—A 400-ft. cross-cut has cut the vein disclosing a large body of ore; at the St. Lawrence sinking from the 900 to the 1,100-ft. levels is in progress.

Butte & Boston Mining Company.—A vein 12-ft. wide of good ore has been cut in the Gray Rock mine on the 1,100-ft. level.

Colorado Smelting and Mining Company.—At the Gagnon mine large quantities of ore are being stoped on the 1,000-ft. level. The shaft is down to the 1,100-ft. level, where a station is being cut; ultimately the shaft will be sunk to the 1,200.

The foregoing are some of the deepest copper mines in Butte, and the statement that the ore bodies are of good grade and good size at this depth is interesting. The Henry mine, where it was thought copper ore had been discovered a half mile further west than any copper mine worked at present, is now shut down. The shaft was sunk 200 ft. by leasers who expected to find ore; however, nothing but black tale was struck. There is a possible extension of the copper-bearing area to the east as far as Park Canyon, two miles east of the Tolusa and Silver Bow mines, Missoula Gulch, however, seems to be the limit of copper ore on the west. The operations of F. A. Heinze on the Sullivan mine, in Park Canyon, will do much to prove the presence or absence of copper ore in that vicinity.

NEVADA.

Eureka County.

The Eureka & Palisade Railroad Company received during the month of May 2,113 tons of ore from the mines of Eureka district for shipment to Salt Lake City, as follows: From the Diamond mine, 1,144 tons; Eureka Consolidated mine, 381 tons; Jackson mine, 174 tons; Richmond mine, 134 tons; Hamburg mine, 110 tons; Phenix mine, 61 tons; Dunderberg mine, 31 tons; Bullwacker mine, 15 tons; Williamsburg mine, 15 tons; Delaware mine, 13 tons; R. J. & Co., 13 tons; Ethel mine, 11 tons, and Resene mine, 11 tons. From Hamilton, White Pine County, from C. A. Mathewson, 18 tons; Tom Cornell, 45 tons, and Zorani Brothers, 50 tons. Total from White Pine, 113 tons.

Lincoln County.

Yuba.—A good body of ore has been opened on the 1,225-ft. level west. The ore is galena and carbonate; it assayed 96 to 222 oz. to the ton. A drift is being run from the 13th level to connect with the old Mazepa shaft, for the purpose of ventilation.

Storey County.

Consolidated California & Virginia Mining Company.—According to the last official weekly report, about 175 tons were extracted from the mines, the average assay of which was \$29.48 per ton.

Kentuck Consolidated Mining Company.—On the 1,100 level the south drift is in milling ore and the raise near the north line and the joint east cross-cut on the Yellow Jacket south line are in ore of fair grade. All work has been stoped on the 160 level and the men are employed on the 1,100.

Occidental Consolidated Mining Company.—Some ore of fair value is being stoped on the 650 level.

Potosi Mining Company.—The south drift, 200 ft. east of the Potosi winze, on the 930 level, shows 5 ft. of fair milling ore in the face. The north drift opposite this shows 5 ft. of good ore, and there is 3 ft. of fair grade ore on the top of the raise from this drift. In the north raise above the 1,000 level 7 ft. of good ore is exposed. During the past week 709 tons was stoped from the 550, 930, 1,000 and 1,150 levels; 620 tons was milled with an average battery assay of \$28.14, and a car sample assay of \$31.24. During the month of May 2,300 tons of ore were worked, producing bullion with a net value of \$26,947.88, exclusive of milling costs, amounting to \$13,800. The average assay value of the ore per ton was \$24. Gross value of the bullion per ton, \$17.75; net value of bullion per ton, \$11.71. The mill yielded 73% of the assay value.

Storey County—Comstock Lode.

(From our Special Correspondent.)

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

Mines.	Tons M'ld	Av Car Sample Assay.	Tons M'ld	Av. Battery Assay.	Bullion for Week.	Bullion shipped.
C. C. & Va.	175	98.49	.....	.....	.....	.....
Justice	70	20.00	.....	.....	.....	.....
Potosi	709	31.24	620	28.14	.....	.....
Savage	169	32.54	.....	.....	.....	1354 1/2

¹ Crude bullion shipped to Carson Mint. ² Cars.

Consolidated California & Virginia Mining Company.—All expenses for May have been paid, the company has a cash balance in hand of \$62,169. The work in the mine is not of a particularly interesting character just now. It is reported that Mr. Mackay will arrive on the lode during the current month when, undoubtedly, affairs would

brighten. The reports of this long delayed visit have been so persistently contradicted by the fact that it is really uncertain when he will arrive.

Justice Silver Mining Company.—The vein in the south drift, 822 level, is 4 ft. wide and the car samples are averaging from \$15 to \$25 per ton. The ore now being extracted is from the north and south stopes on the same level.

White Pine County.

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

Lucky Deposit Mine.—This group, consisting of six claims, is in Silver Canyon district, on the eastern slope of Schell Creek Mountain. The mine is in the foothills, and is little troubled by snow. This property was discovered seven years ago, but little work has been done on it. Several hundred tons of red oxide of iron ore averaging \$5 oz. silver, 7% lead and a few dollars gold per ton, have been shipped. Eight openings have been made on the vein, all of which are in ore; the vein in these shows from 1 to 5 ft. wide, and as they are several hundred feet apart it would indicate that the vein is continuous. None of these openings are more than 50 ft. deep; 500 tons are now on the dump, and there is about 700 tons in sight. Occasionally samples of the vein run as high as 1,000 oz. silver. Recently the property was purchased by Salt Lake capitalists for developing it without offering their stock for sale, however. This mine has been favorably reported on by several experts, and the ore considered a very desirable one by smelters, as it contains 40% iron and brings its full gold, silver and lead values.

NEW MEXICO.

Alabama Belle Gold Mining Company.—At the annual meeting in Birmingham, Ala., June 16th, the directors elected were: G. C. Arrington, D. D. Kennelrew, F. D. Young, Dr. W. H. Johnston, M. S. Blank, Morris Kleinhauser, T. Smith, S. Heule, E. Wald. The officers were G. C. Arrington, president; Dr. W. H. Johnston, vice-president; D. D. Kennelrew, treasurer; F. D. Young, secretary. Arrangements were made to go on with the work of developing the mine.

Socorro County.

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

Graphic.—This group of mines in the Magdalena district, near Kelley, has been sold to Terre Haute and Philadelphia parties for \$90,000. The ores are lead carbonate carrying silver, and a very excellent hematite, also argenteiferous; the company is organized under the laws of Indiana with the title of the Graphic Carbonate Mining Company, with its principal office at Terre Haute. The ores are sold usually to the Rio Grande Smelter at Socorro. The following are the officers of the company: John R. White, Philadelphia, president; Preston Hussey, treasurer; Dr. J. P. Worrell, secretary, and A. D. Fitch, general manager, the last three gentlemen being from Terre Haute.

OREGON.

Baker County.

Mabel.—The shaft is down 40 ft. on this property and during this development work it is estimated that \$60,000 of ore has been sacked. The ore on the dump is said to run \$100 a ton. Many of the specimens in the mine show free gold in large quantities.

Douglas County.

Canyonville Mining and Water Company.—This company, operating hydraulic mines, desires to purchase some 200 tons of sheet iron during the coming fall, for the purpose of manufacturing hydraulic water pipe.

Josephine County.

(From our Special Correspondent.)

A 6-ft. gold-bearing quartz ledge has been struck a few miles from Korbly by Geo. H. Briggs. Work has been started and the find will be developed to its full capacity. Milling facilities are convenient.

PENNSYLVANIA.

Anthracoite Coal.

Susquehanna Coal Company.—A severe explosion of gas occurred June 22d in the old No. 1 shaft of this company's colliery, at Nanticoke. Five men were instantly killed and four more were badly injured. The men were working in one of the lower gangways and it is supposed that a door was left open through carelessness, causing the air to be shut off and the gas to accumulate. The gas was probably fired by the lighted lamp of one of the men.

Bituminous Coal.

An important sale of coal lands is to be held July 3d, when about 6,000 acres in Armstrong County will be sold under foreclosure of mortgages given by the Brady's Bend Iron Company. The property is to be sold in one parcel and without reserve.

Under the amendment to the mining law passed by the legislature at its last session the number of inspection districts in the bituminous region has been increased from eight to ten, and two new districts have been formed. The ninth district will include all the mines on the east side of the Monongahela, from McKeesport to Lock No. 3, and all the mines on the Youghiogheny from McKeesport to Connellsville and those extending north of the latter place to the Westmoreland County line. This district is mostly taken out of the old fifth, which had grown

too large for one inspector. The new tenth district will include the counties of Fulton, Bedford, Huntington, Blair, with parts of Cambria, Jefferson and Clearfield.

Northampton County.

Allan Cement Company.—This company has completed a new plant for making Portland cement near its quarries, at Siegfried's Bridge. Heretofore only ordinary cement has been made. Some of the company's quarries are now worked to a depth of 100 ft. The new plant was designed by Superintendent A. B. Bonneville.

TENNESSEE.

Tennessee Coal, Iron and Railroad Company.—This company's statement for the month of May shows net earnings for the month \$67,100, an increase of \$12,600 or 23% over May, 1892. The fixed charges for the month were \$60,300, leaving a surplus of \$6,800.

UTAH.

Plute County.

(Reported for the "Engineering and Mining Journal.")
The rock formations in the Mount Baldy range are quartzite lime, trachyte, granite and slate. The ores are gold, silver, lead and antimony with some selenide of mercury.

From Mr. John S. Ferris, who will be remembered as the original discoverer of the Leeds and other mines, in Silver Leaf, Utah, we derive the following information concerning the Mount Baldy mining district, in which he has been located since 1877: The Mount Baldy range is a gold region with many good prospects. It contains as well some silver mines. A number of incorporations have been made in Salt Lake City to work the mines of Marysvale, the most noted of which is the Bully Boy and Webster. This is a good property. The Dalton Mining Company has shipped gold ore which is sampled by the carload over \$400 per ton. The Deseret Mining and Milling Company has 30 ft. of ore in the ledge. On the Branch mine, belonging to this company, a tunnel was run over 350 ft. to cut the vein 300 ft. below the croppings; at the point where the vein was cut it was found to be 34 ft. wide, the ore running well in gold, silver and carbonate of lead. It is the intention of this company to erect a mill during this summer. The John Lincoln claim, of the Ferris Gold and Silver Mining Company, has a tunnel now in 200 ft. on the vein; the ledge is about 50 ft. wide and assays as high as \$152 a ton have been obtained from the pay streak. Good assays have been obtained from the Storm King, although but little development work has been done. On Indian Creek, on the west side of Mount Baldy, there are a number of good gold properties, including the Rob Roy. The Sevier mine is said to have large quantities of ore on the surface that will average \$20 a ton. The Grasshopper group, near the Sevier, is said to be a good property. According to our correspondents this district offers good opportunities for capitalists.

Alma Mining Company.—This property is an extension of the Deer Trail mine. The tunnel is now in 600 ft. and will soon cut the lead 500 ft. below the outcrop. The ore is chiefly carbonate of lead and gray copper; the lead assays run from 10 to 80% lead with from 3 to 800 oz. of silver, and from a trace to \$250 a ton gold. The company is organized with a capital of \$1,000,000 of 500,000 shares at the par value of \$2 each, 100,000 of which have been placed in the treasury. No ore has been shipped from the property, as it is 200 miles to Salt Lake City, the nearest reduction point. The company was organized by the discoverer, Mr. D. A. Giles.

The Deer Trail mine is at present lying idle. The Lucky Boy, in the croppings of which selenide of mercury was found, is also idle. The mill on the Bully Boy and Webster, belonging principally to R. C. Chambers, has just started operations. The Huntington mill, on the Dalton group, will soon start on the rich gold ore of this property. This mine is said to have excellent prospects. The Rob Roy mine, which was bonded recently for \$125,000, is working actively. The Gold Belt mine, which adjoins the Dalton, is said to be an excellent prospect. The owners of the Branch mine will erect a mill during the summer. For the above information we are indebted to Mr. D. A. Giles, of the Alma Mining Company.

VIRGINIA.

Tazewell County.

Roanoke Coal and Coke Company.—At the annual meeting in Roanoke, Va., June 14th, the following officers were elected: Wm. Booth, president; W. C. Brooks, vice-president; A. D. Rice, secretary and treasurer, and Wm. Booth, W. C. Brooks, W. S. Cowell, M. Fackenthal, D. I. Backman, J. B. Stephenson and Delos Thomas, directors. W. S. Cowell was elected general manager. The company's property is located on the north fork of the Elkhorn. It has 100 coke ovens in course of erection and is already producing a fine quality of Pocahontas coal.

WASHINGTON.

(From our Special Correspondent.)

The mine near Everett, upon which such great expectations have been built, seems to be fulfilling the anticipations formed. The ore contains gold and silver but carries a percentage of baser metals, and averages per assay over \$200 per ton. A ship-

ment of 560 tons of ore has been made to the Selby Smelting Works, Port Coster, Cal., which purchased the ore for a lump sum of \$200,000, spot cash.

Lincoln County.

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

Egypt Mining District.—For information concerning this district we are indebted to Mr. C. E. Richards, of Davenport. Veins varying from 6 in. to 16 ft. wide are found in the mountains here at an elevation from 1 to 3,000 ft.; these carry both gold and silver, and the formation is principally granite. However, on the east and west of the district one wall is usually granite with the other slate, shale or limestone. The ore also contains copper. Galena and pyrites are usually found near the surface. As yet they are not prospected to any depth. In the John L. mine a tunnel 100 ft. long has been run cutting the ledge at a depth of 50 ft., exposing a good body of ore, several car loads from which yielded \$60 a ton above all expenses, when shipped to Montana. The Egypt mine has a tunnel 95 ft. long and a shaft 75 ft. deep; the ledge was cut at a depth of 35 ft. where it is 12 ft. wide. A shaft 40 ft. deep is on the Silver Queen property, from which a drift 30 ft. long was run and then a winze was sunk 10 ft. deep. A ledge 4 ft. wide was cut 60 ft. below the surface. There are two streaks of ore in this vein; one about 14 in. wide, the other about 6 in. The last assay from this property was copper \$64.12; lead, \$19.44; silver, \$31.29. No ore has been shipped from the last mentioned claim. The ore in this district is said to improve in quality as it is sunk upon and the veins are said to widen. The ore must be worked by concentration. As yet no free milling ore has been found. Free gold float was found, however, a few days ago and placer ground is being worked by Chinamen.

Stevens County.

Kitty B.—There has been nearly 200 ft. of development work done on this property, which is near Colville; 5 ft. of ore is in the face of the tunnel, which is said to assay from 60 to 125 oz. silver per ton.

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

Old Dominion Mining Company.—In the second tunnel on this property, at a depth of 300 ft., 5 ft. of lead carbonate has been struck, between a hanging wall of lime and foot wall of granite. The ore assays 20 ounces of silver and 30% lead. The Reeves mine adjoining this on the south and west has developed 6 ft. of gray copper ore. The Bonanza mine which was drowned out last February is being drained and work will be resumed about July 1st. If the Colville smelter starts operations two car loads a day from the Bonanza will be shipped to that works. Lead carbonate ore assaying 80 oz. of silver is being found in the Daisy property west of Colville. The main shaft on the Dead Medicine mine is down 80 ft.—two drifts 50 ft. long are all in ore and the concentrator is running. The Columbia mine, 20 miles north of Colville, has been bonded to Denver parties for \$25,000; little development work has been done on this property, but a 4-ft. ledge between lime and a slate running 40% lead and 30 to 40 ozs. of silver has been disclosed. Five feet of Galena ore is shown in the Sugar Loaf mine in the 40-ft. shaft, a 3-ft. ledge of peacock copper, running 7% copper and 33 oz. silver and \$10 gold, has been discovered by Thomas Haller who estimates that he can produce 10 tons a day.

WEST VIRGINIA.

West Virginia Freehold Land Development, Mining and Railway Company, Limited.—This company recently offered in London £200,000 of its £250 capital stock, in £2 shares. According to the prospectus issued the company has an option on the timber and mineral rights on 114,393 acres of land in Wyoming, McDowell, Logan and Webster counties. Besides these rights it is proposed to buy about 60,000 acres of the land for sites for the necessary works, for town sites and other purposes. The company proposes to develop these lands, cutting and marketing the timber and mining coal, and also to build railroads to connect its property with the Norfolk & Western or other railroads. The purchase price is given at £175,000, and it is to be noted that the vendors will retain the fee of about half the lands, on which they sell only the timber and mineral rights. The land has a certain value for timber, though now somewhat remote from markets; its value for coal or for agricultural purposes remains to be tested. It is also stated that there are deposits of iron ore and limestone on the tract.

WISCONSIN.

Pierce County.

Eagle Iron Company.—The mine of this company at Spring Valley is on a deposit of brown hematite ore, containing about 55% iron. The company has just completed a blast furnace using charcoal as fuel; it is about 1½ miles from the mines, and the ore is carried by a gravity railroad. The furnace is 65 ft. high and 13 ft. in diameter at the bosh. It is equipped with two blowing engines, capable of delivering 15,000 cu. ft. of air per minute, the air being heated to a temperature of 1,000° before entering the furnace by two iron hot-blast stoves. Six boilers, 30 ft. long and 54 in. in diameter, with two 18-in. flues, furnish the necessary steam. Connected with the furnace are a casting-house, stockhouse, engine-house, boiler-house, blacksmith shop and a machine shop, all of which

are equipped with separate power. The buildings are constructed wholly of brick and iron. The annual capacity of the furnace is about 25,000 gross tons. Employment is given to 55 men. The company owns 75 acres of land, on which it has erected 11 dwelling houses for the use of its employees, and has arranged for the erection of 15 additional ones. The officers of the company are: President, S. Frank Eagle, Chicago, Ill.; vice-president, F. S. Wright, Newark, O.; treasurer, Wm. S. Eagle, Spring Valley, Wis.; secretary, H. C. Truesdale, Minneapolis, Minn.

WYOMING.

Fremont County.

A rich gold discovery has been made in the neighborhood of the Miner's Delight. Gravel and cement gravel have both been worked, showing excellent results.

FOREIGN MINING NEWS.

BOHEMIA.

Nearly 10,000 men employed in the coal and iron mines near Kladno are on strike, and it is feared that all the miners of Bohemia will join. The strikers have had several encounters with the police.

BRITISH COLUMBIA.

Kootenai.

Billion.—Two thousand feet of development work will be done during the summer on this property, near Yale.

Lexington.—This group of mines has been bonded to James M. Kellie for \$60,000. They are situated 12 miles from Lardeau.

CHILI.

It is stated that all the nitrate companies are now earning good profits. The output for 1893 is estimated at 19,000,000 quintals, against 17,000,000 in 1892.

San Donato Nitrate Company.—The profit and loss account for the year of 1892, after deducting £1,111 for depreciation, shows a net balance of £9,882, which added to the balance of last year makes a total of £15,193. It is proposed to take £6,000 to the reserve fund, and to carry forward the balance. During the year the mine was worked for only six months, being restricted to that time by the combination.

San Jorge Nitrate Company.—In 1892 this company showed a profit of \$308,000 for six months, against \$725,000 in 1891 for seven months' work. The output was 749,000 quintals in 1892, against 690,000 in 1891.

Santa Rita Nitrate Company.—This company had a net balance of £3,832 at the end of 1892, having worked but six months. An interim dividend of £2,800 was paid in December, leaving a present balance of £8,000, out of which it is proposed to pay a further dividend.

EAST AFRICA.

Nyassa.

The Nyassa company has been organized in England to develop the mineral resources of the district lying between Lake Nyassa and the coast at Pemba. The intention of the company is to build a railroad between those two points. Exploration of the country has shown an extensive coalfield, and the coal taken from the outcroppings is of excellent quality and suitable for steamship use. The coast region is exceedingly unhealthy, being almost fatal to whites, but it is said that the high regions of the interior where the coal mines are situated is healthful.

GERMANY.

Hercynia Copper Company.—This company was formed in July, 1891, to acquire and work 30 copper and silver mining concessions at Rottelbrode, near Naudhassen, in the Hartz Mountains. The nominal capital was £165,000. Owing to want of sufficient working capital and to the alleged failure of a former director to provide the same according to agreement the company got into difficulties, and in January last a winding-up order was made on a creditor's petition. The creditor side of the accounts shows total liabilities £22,641, of which £21,750 are fully secured. The contributory deficiency amounts to £112,772. At a recent meeting of the creditors and shareholders the chairman stated that a reconstruction scheme had been formed for winding up the present company by selling the whole of its shares to a new company, to be formed in England, with a capital of £50,000 and debentures for £25,000, bearing interest at the rate of five per cent. per annum. Nothing was done, however.

INDIA.

Nerbudda Coal and Iron Company.—The report of the directors for the year ended 31st December last states that the output of coal amounted to 16,271 tons, of which 12,436 tons were sales, 2,129 tons colliery consumption, the balance being stock on hand. The revenue account shows a profit of £1,359, which, after debiting exchange in respect to remittances with £380, leaves a balance to be carried to profit and loss account of £1,020. After charging profit and loss account with income tax, £73, and the sum of £1,500 from buildings, there remains a surplus to be carried forward of £210. The manager's efforts to prove the extension of the new coal field to the west of the existing workings have been successful. By means of boreholes, four seams of

coal of good quality have been proved, extending over a large area. The government has granted to the company mining rights over this new coal field, together with the option of taking up other plots of adjoining land. The manager estimates that it will be necessary to expend in the current year a sum of £5,000 or £7,000 in completing the prospecting, sinking one pit, driving levels, providing pumps, winding engine, etc. Of this sum about £3,500 would form part of the permanent expenditure to be incurred in the second and following years before the coal field would be completely developed. The directors propose to raise this money by means of debentures, leaving for future consideration the question of how the further expenditure should be provided for, whether by calls on the existing shares or in some other manner.

MEXICO.

Durango.

Valardena.—The main shaft of this mine has reached a depth of 350 ft.; 1,000 tons of ore shipped monthly to the Omaha Graut Smelting Company. The new smelter will be completed in about three months, it will have four stacks and a capacity of about 200 tons daily.

Puebla.

Zacatlan Iron Works Company.—The iron deposits owned by this company, an English corporation, have been examined by Mr. John Birkinbine. It is said that an average of 200 analyses gave 54% metallic iron, with 0.5% phosphorus. The company will put up a small blast furnace, a foundry and machine shops, and, it is said, at a later date rolling mills will be erected. The mines are said to be well situated so far as proximity to water power, limestone, manganese, and wood for charcoal. Iron now sells in the City of Mexico for \$73 per ton, and it is expected that this company will be able to lay it down for \$50. The mines are 173 miles from Mexico and 74 miles from Puebla. The company will build 50 miles of railway, which will cross the Mexican Railway and connect with the Inter-oceanic. The capital of the company is £350,000.

Souora.

New Imuris Mines, Limited.—At a meeting of this company recently held at Shanghai, China, the chairman of the company stated that he had received advices from London to the effect that the feeling in that city was, in the face of Mr. John Hays Hammond's adverse report, that there was no alternative but to wind up the company. However it was thought that the Chinese stockholders should be given an opportunity to express their opinion. It seems that Mr. Whyte, the manager of the mine, reported that there was 60,000 tons of ore in sight in one mine alone, and the prospects of continuing since that were excellent. He estimated that a profit of \$10 a ton could be made, which, estimating the daily treatment of 100 tons, would make an annual profit of over \$300,000. Mr. Whyte's report was made April 10th, 1892. Ten months later Mr. Hammond made an examination of the property for the benefit of the stockholders and summed up his report as follows: "First, there is no mineral at present exposed on the company's property that can be worked with a profit; and second, that the indications are most unfavorable for the discovery of valuable ore bodies by further exploration." The original company under the title of the Imuris Mines Limited was registered in London September 27th, 1883, with a capital of £175,000. The company paid for the property £125,000, £67,000 of which was in cash and £58,000 in fully paid shares. The operations of this company proving unsuccessful it went into liquidation and the new company, under the title of the New Imuris Mines Limited, was organized with a capital of £200,000 in 200,000 shares of £1 each; of these 62,000 shares were held in Shanghai, 10,000 being in the names of Chinese.

Zimapan.

According to the "Mexican Trader" the mines of Zimapan in former days were worked quite extensively for gold, and the district still offers favorable chances for prospecting.

NEW BRUNSWICK.

Memramcook Gold Mining Company.—This company has bought a 10-stamp mill and will soon have it in operation. Meantime, ore is being taken from the outcroppings for trial in the mill.

Queen's County.

Grand Lake.—A small commencement has been made, according to the Fredericton "Herald," in developing these mines in the vicinity of the Newcastle River. At this point there is a vein of coal varying from 20 to 30 in. in thickness and from 20 to 40 ft. below the surface. At several points drifts have been run into the side of the hill and the coal mined without any attempt at scientific working. About 6,000 tons were taken out in this way last year and it has now been decided to work the vein more systematically. The owners have put in engines with hoisting machinery and pumps and have commenced to sink a shaft upon the veins.

NEW GUINEA.

(From our Special Correspondent.)

Joseph McCaulay, who returned to the United States some months ago after being very successful in the goldfields of this island, left San Francisco May 24th with a party of miners, who propose exploiting the new placer grounds in a systematic manner. The party took with them a complete hy-

draulic plant, and upon their arrival at Sydney, N. S. W., will have two other hydraulic machines made. They will outfit at Cooktown, Queensland, and sail from there direct to New Guinea. McCaulay alleges that the new ground is wonderfully rich, but the very few miners who have found their way to the fields have worked only with pick and pan.

NEW SOUTH WALES.

Ballarat.

The mining returns from the Ballarat central division for the quarter ended March 31st show that 50,946 tons of quartz were crushed which yielded 20,018 oz. of gold. The pyrites treated amounted to 328½ tons, yielding 762 oz., while the yield from alluvial during the term has been 764 oz. During the quarter the sum of £22,944 has been paid in dividends, the Star of the East Company heading the list.

NOVA SCOTIA.

Boston & Nova Scotia Coal Co.—This company was fully organized recently at a meeting held in Halifax, when the following officers were elected: President, J. W. Candler, Boston; vice-president, John McKeen, Mahou; treasurer, W. J. Fraser, Halifax; secretary, A. C. Ross, North Sydney; directors, David S. Baker, jr., Providence, R. I.; John C. Cobb, Boston; R. P. Fraser, Pictou.

Columbia Mining and Milling Company.—This company's mines are now being worked under contract. A recent return from the mill gave 58 oz. of gold from 225 tons crushed.

Gay's River.—The large stamp mill put up here two years ago, which has never been used, has been sold for \$5,000 to a company which intends to operate at Memramcook, New Brunswick. The mill and buildings are to be removed.

Truro Gold Mining Company.—This company recently struck a pocket of very rich ore in its mine at Caribou. The ore is quartz containing free gold, and 110 oz. of gold was obtained from four tons of selected ore.

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

New Egerton Company.—The Egerton Company, composed of New Glasgow, N. S., adventurers, purchased in 1877 a number of mining areas in the Fifteen-mile stream gold mining district. A 10-stamp crushing mill had been erected previous to the purchase. This company operated the mine until December 31, 1889. During that time they mined 4,871 tons of quartz, from which they obtained 2,320 oz. of gold, value \$44,085. They then sold out to another company of New Glasgow men, who styled themselves the New Egerton Company. These men put in a new 15-stamp mill, and new hoisting and pumping gear. For the year 1890 they mined and crushed 2,476 tons of 2,000 lbs. quartz, which yielded 2,184 oz. gold; in 1891, 4,263 tons quartz yielded 2,446 oz. gold, and for 1892, 2,460 tons quartz, which yielded 1,285 oz. gold. Total for those three years 9,199 tons quartz, gold 5,915 oz., value \$112,373.

For the total period worked by the Egerton and New Egerton companies the number of tons quartz raised was 14,070, and the yield of gold 8,235 oz.; value \$156,470. The profits were something in excess of \$40,000.

Last winter an amalgamation was completed with the Stanley Company owning adjoining property, and work was resumed in May, after stopping through the winter, the management being in the hands of the New Egerton Company. The mine is now free from water, and mining and crushing has begun on a limited scale. The mine is equipped with two crushing mills—one, the Stanley, being driven by water—good hoisting gear, pumping apparatus, air compressor, and air drills and such other machinery as is necessary for free milling ore.

The district is situated in Halifax County, some miles north of the Dufferin mine, famous for gold and lawsuits.

ONTARIO.

The annual meeting of the Kingston & Pembroke Mining Company was held in Kingston, May 23d, when the following directors were elected: H. Seibert, J. D. Flower, J. H. Hollister, New York; W. G. Pollock, Cleveland, Ohio; M. H. Folger, B. W. Folger, F. A. Folger, J. Bowden and C. F. Gilder-sleeve, Kingston.

Sudbury Nickel Mine Co.—At the annual meeting in Berlin, Ont., recently the old board of directors were re-elected as follows: J. G. Reiner, Wellesley, president; Jas. Livingston, Baden, vice-president; C. H. Ahrens, Berlin, secretary-treasurer; F. Walter, Hamburg; C. Kritzinger, Heidleburg; Dr. W. Morton, Wellesley; F. B. Puddicombe, Haysville; Geo. Fleishaur, Tavistock; J. D. Moore, M. P. P., Galt. A motion was carried authorizing the board of directors to make arrangements to work the mine to the best interests of the stockholders.

Lake of the Woods District.

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

Black Jack.—An important new find is reported from this property. Specimens have been brought in which compare well with the best produced in this country. Two shafts are being sunk on the property, both of which will be equipped at once with hoisting machinery. It is reported that the Crawford mills at the Black Jack are a failure.

El Diver.—A disastrous fire on June 1st destroyed the mill at this mine. Good results are reported from the Crawford mill, which has had a trial run

of about six weeks. The shaft at 100 ft. is in good ore.

Northern Gold Company.—This company is operating the Gold Hill mine, at which a new find was reported recently. A large mill employing the Leede process has been completed, and will be started on the completion of the tramway connecting mine and mill.

Norway.—This is a new project situated close to the Treasure. Surface work has exposed a vein averaging 4 ft. in width of good free milling ore.

Rajah.—This property is operated by an English company named the Rajah Gold Mine Limited. Two shafts are being sunk in neither of which pay ore has yet been encountered.

Rat Portage.—An American syndicate has purchased the reduction works at this point, and will at once equip them with the best modern machinery.

Sultana.—The 10-stamp mill on this property has been closed temporarily for want of ore. A shaft is being sunk which is said to be in fairly good ore. The new buildings for the cyanide process have been commenced.

Treasure.—This mine as well as El Diver is owned by Mr. J. H. Webster, of Cleveland. Two shafts have been sunk on this property, both of which are in pay ore.

PERU.

(From an Occasional Correspondent.)

Cacachara Mines.—These mines are owned by a company formed in Chile which acquired the rights of Gen. J. M. Echevique. They are situated in the department of Puno at about 24 leagues distance from the town of that name and terminus of the Southern Railway of Peru. "El Peruano," official journal of the Peruvian Government, in November, 1878, stated that the district was discovered in 1760, and competing in production with the famous mines of Caylloma Laicacota the mines were worked until 1780, when the Indian insurgents under the renowned Tupac Amaru sacked the place, killing all the Spaniards and half-breeds and destroying and filling up the most important workings. Don Modesto Basadre, a celebrated traveler and authority on the history of Peru, nearly the whole of which he has visited at various times, in a paper contributed to the Geographical Society of Iowa, in December, 1891, stated that the district of Cacachara is the richest in the whole of Peru, and that in the whole cordillera of Peru, Bolivia and Chili which he has traversed there is no such a powerful body of ore to be found.

Mr. Franz German, M. E., in a report upon the district, published in 1890, refers to the avidity with which the possession of Cacachara was disputed by the caciques, curas and all the principal miners of Puno, and says that in 1779 they were worked by the Spanish Alcalde Real of mines. With the wars of the Independence the mines, in common with all the rest in Peru and Bolivia, were abandoned and later on became the property of the late General Ruforo Echevique, at that time president of Peru. In 1854 the mines were examined and reported upon for the General by an English engineer named Wild; in 1873 by a Cuban, Senor Fernandez de Castro; in 1890 by the Austrian Mr. Franz German; in 1891 by the Chilean Senor Gustavo Gabler; in the same year by the official engineer of the Peruvian government, Don Carlos Postits, and finally last year by Senor San Roman. The five last reports have been published in pamphlet form. According to the last report of the directors: Without taking into consideration the reconnoitering work, nor the unburying and propping, etc., which it would be impossible to detail, the present company has actually run 3,489 meters of permanent work, with 1,751 meters of rails. Fourteen frontones have been opened up, which are all in ore, the width of the vein in each of them averaging from 40 to 80 centimeters; the average assay of the ore gives nearly 100 oz. per ton, with from 40 to 50% of lead and about ½ oz. of gold.

TASMANIA.

Gold Mines.—The following gold mine returns are made for the month of April: New Golden Gate, Mathinna, crushed 1,420 tons of ore; average yield, 17 dwt. per ton. Volunteer, Lefroy, crushed 230 tons; average yield, 3.8 oz. per ton. New Pinafore, Lefroy, crushed 1,200 tons; average, 10 dwt. per ton. Derby mine, Derby, crushed 375 tons; average, 15 dwt. per ton. Reunion, Mangana, crushed 23 tons; average, 19 dwt. per ton.

Mount Lyell.—A test parcel of 100 tons of copper ore from these mines was recently treated at the Argenton smelter, under the supervision of Dr. Peters. The ore contained about 7% copper. The product of the smelter was a 50% copper matte carrying about 100 oz. silver and 2 oz. gold to the ton. The matte will be sent away to be refined.

Roy's Hill Proprietary Company, Limited.—The report for March says: The shafts are numbered 1 to 4. The number of known lodes is eight; two have been prospected, one, marked near Roy's Lea Creek, found good tin stone on surface. There are several formations between the lodes we are sinking and Roy's Lea, where the surface tin is found. No. 2 lode is proved 245 ft. along its course. No. 1 shaft (south) is 6 ft. by 4 ft., and 16 ft. deep; the lode is 4 ft. thick, strong and well defined; 7 tons of tin stone raised from this shaft contains 4% to 5% tin. No. 2 shaft is 7 ft. by 4 ft., and has been sunk 25 ft.; the country is broken; there is some good tin at this

depth, but nothing defined; 8 tons of stone have been taken from this shaft, worth from 30% to 40% of tin. No. 4 shaft is 7 ft. by 4 ft., and has been sunk 11 ft.; there is 4 ft. of ore; 10 tons of stone on surface contains from 12% to 15% of tin.

COLOBADO ORE MARKET.

Denver. June 17.
(From our Special Correspondent.)

For the two weeks ending June 17th the receipts of ore in this market, offered for competitive bid by the three public sampling works, amounted to 749 tons. Good prices prevail for the various characters, and extra good prices were paid for heavy iron (sulphide) ores and concentrates carrying copper. There was, however, a notable falling off in the fancy prices paid two weeks ago for low, medium and heavy grade lead ores and concentrates. For the very heavy leads from 50 to 57 cents per unit was paid, which, with the low price of lead in New York, might be considered a fancy figure.

No. 1. Of straight silicious ores, carrying no lead, there was sold 273 tons, which stood a treatment charge of from \$10 to \$15, the charge varying with the per cent. of silica.

No. 2. Of silicious lead ores carrying from 5 to 13% lead there was sold 160 tons, which brought from 25 to 35 cents per unit for the lead and stood a treatment charge of from \$8 to \$11 per ton.

No. 3. Of heavy lead ores carrying from 20 to 74% there was sold 197 tons, which sold at from nothing off for smelting up to \$7 per ton, and the lead brought from 45 to 57 cents per unit.

No. 4. Of copper ores and concentrates running heavy in iron there was sold 69 tons, which stood a treatment charge of from \$4 to \$10 per ton, the treatment being reduced in proportion to the per cent. of iron carried, and the copper being paid for at the rate of 80 cents per unit.

No. 5. Of heavy iron ores and concentrates (sulphides) there was sold 69 tons, which stood a treatment charge of from \$6 to \$9 per ton, varying with the per cent. of iron.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 593, 594 and 600.]

NEW YORK, Friday Evening, June 23.

There has been no feature of interest in the mining stock market during the past week. There has been a fair inquiry for two or three of the stocks, but few actual sales have resulted.

The Comstocks have been quiet and closed somewhat lower in price. Consolidated California & Virginia declined from \$1.95@1.70; total sales were 400 shares. Comstock Tunnel shows transactions of 700 shares at 6@7c. Of Mexican, 200 shares were sold at \$1.05@1.10. Other sales were 125 shares of Best & Belcher at \$1, and 150 shares of Ophir at \$1.60.

Of the California stocks, Standard Consolidated was in fair inquiry; the total sales amounted to 150 at \$1.25. The company has declared dividend No. 82 of 10c. per share, payable July 25th. There was a solitary transaction of 100 shares of Bodie Consolidated at 37c.

The superintendent of the Albany Gold Mining Company telegraphed as follows from Jackson, Cal., under date of June 22d: The Littlefield tunnel is now cutting ore that is producing high assays. The outlook is very encouraging.

The Colorado stocks were quiet this week. Leadville Consolidated shows sales of 987 shares at 15@17c. Of Lacrosse, 1,700 shares changed hands at 4@5c.

A letter from the Victor Gold Mining Company, of Cripple Creek, Colo., dated June 19th, says: The last ear of ore settled for by the Omaha & Grant smelter netted over \$3,500, or about \$400 per ton. The mine is in good shape.

During the week there was a fair inquiry for Moulton and Alice. Actual sales, however, amounted to but 1,000 shares of Moulton. Closing quotations were 30@31c.

Ontario was traded in to the extent of 33 shares at \$15 50@16.

Kingston & Pembroke, which has not been traded in for a long time, this week shows a sale of 100 shares at 15c.

Boston. June 22

(From our Special Correspondent.)

The market the past week has shown a much better feeling among the dealers in copper stocks, and there is more disposition to buy the good stocks and less desire to sell. There is some short interest in the market and the stronger outlook for the future of copper with a slight advance on both sides of the water, has created a covering movement and prices have advanced in consequence.

Boston & Montana advanced from \$20 1/4 to \$22 on moderate sales and lost only a fraction on the reaction. At a special meeting of the company held yesterday it was voted to increase the capital by the issue of 25,000 shares, giving the stockholders the right to take one share at par (\$25) for each five now held.

Butte & Boston has ruled quite strong with a good buying demand, and advanced from \$6 3/4 to \$7 1/2, with later sales 1/4 less. The stock is said to be booked for higher prices.

Calumet & Hecla was weak in the early dealings and sold at \$280, rallied to \$284, but lost the advance and sold again at \$280. To-day \$285 was bid for it and \$289 asked.

Tamarack advanced from \$140 to \$143 subsequently declined to \$140 1/4 for a lot of 25 shares. Quiney declined from \$112 to \$105 with no great disposition to buy it even at this figure. Osceola has been exceptionally strong throughout the week, selling at \$26 1/2 and at \$27, with a good demand at the latter figure. Franklin holds steady at \$12 1/2 to \$12 3/4.

Atlantic sold at \$7 1/4, an advance of the fraction. Centennial lost one quarter, selling at \$6 1/4. Kearsarge declined from \$7 to \$6 1/4. Allouez sold at 40c. and Arnold at 20c.

Tamarack, Jr., sold at \$15.
3 p. m.—There was no special change after the noon hour. Butte & Boston was firm at \$7 1/2 and Tamarack declined to \$140 1/4.

San Francisco. June 16.

(From our Special Correspondent.)

The fluctuations in the favorite mining stocks during the past week have afforded good opportunities to the "chippers," but the market generally remains to-day much in the same position as a week ago. Potosi, in the middle group of Comstocks, and Yellow Jacket in the Gold Hill group, have continued to lead the market, the latter being in more active demand recently than Potosi. The week has, however, been destitute of any important news from Virginia, City, and consequently the movements in prices have been uninfluenced from that quarter.

At the opening of the board this morning prices declined slightly along the entire line, the sales by bear operators being liberal. In the afternoon sessions a reaction took place, helped by buying orders on the Gold Hill line of stocks, and values recovered to a healthier tone. In the Consolidated California & Virginia mine they have started to sink in the lanches of ore on the 1,650 level, and if the showing made is at all good to-day's ruling rate of \$1.85 may be improved upon. Ophir sold today at \$1.75; Mexican at \$1.25; Sierra Nevada at \$1.00, and Union Consolidated at 85c.

In the middle Comstocks Potosi sold at one time to-day down to \$2.10, against \$2.35, yesterday's closing price. Later in the day it recovered to \$2.25, closing steady. Of the other middle stocks Best & Belcher sold for \$1.10; Chollar for 90c.; Gould & Curry for 85c.; Hall & Norcross for 75c., and Savage for 75c.

Of the Gold Hill and South End Comstocks, while Yellow Jacket has received most attention, the outlook in other mines of the group has been such as to warrant more notice than most of them have received for some time. The Kentuck crosscut continues to look well and the indications are said to be promising. On early call the stock sold for 30 cents, but advanced a point later in the day. The sales of Overman were large, the ruling price being 55 cents. Yellow Jacket was in strong demand at \$1.00, advancing to \$1.75, and closing steady at a point off these figures. While little is being said regarding Belcher, the stock is being bought readily to-day at \$1.40. Challenge sold for 40 cents; Consolidated New York for 15 cents; Confidence for \$1.15; Crown Point for 85 cents; Justice for 15 cents, and Bullion for 55 cents.

The outside stocks have sold in small lots only. Bodie sold for 40c., Mona for 20c., the remainder of the miscellaneous stocks being quoted as follows: Belle Isle, Navajo, Mona, Commonwealth and North Belle Isle each held for 10c.; Commonwealth for 5c.; 5c. bid for Grand Prize and Nevada Queen.

The Quijotoa group being loaded down with assessments can be gathered in for a nominal price. Crocker, Peer and Peerless are each being held for 5c.

SAN FRANCISCO, June 23 (By Telegraph).—The opening quotations to-day are as follows: Best & Belcher, 75c.; Bodie, 25c.; Belle Isle, 10c.; Bulwer, 10c.; Chollar, 45c.; Consolidated California & Virginia, \$1.55; Eureka Consolidated, \$1.00; Gould & Curry, 50c.; Hale & Norcross, 35c.; Mexican, 90c.; Mono, 10c.; Navajo, 10c.; Ophir, \$1.45; Savage, 45c.; Sierra Nevada, 65c.; Union Consolidated, 60c.; Yellow Jacket, \$1.10.

London. June 14.

(From our Special Correspondent.)

The business on the Stock Exchange in American mining shares has been quiet and unexcited during the last week. The only approach to speculation has been in low-priced shares, among which Holcomb Valley Gold has had a prominent place. Since the decision of the New Eberhardt Company, announced in this column last week, of ceasing work at the Eberhardt mine and going to South Africa, there have been a good many buyers of this stock, though the price has not been materially affected.

There is no case reported this week of an improvement in the value of an American mining stock, while several have fallen, such as Golden Feather, Yankee Girl, Jay Hawk and Elkhorn, the last mentioned falling in price in spite of a good mining report. There appears to be a party of brokers attempting to squeeze these shares down, but the exact truth is difficult to ascertain.

The Mining and Financial Trust, London, which floated the Elkhorn and De Lamar companies, is about to float another company to work a gold mine in Arizona. Particulars of this property and of the company to be formed are not yet ready for publication.

A company has been registered called the Hall Mines, Limited, with a capital of £300,000, to purchase gold, silver and other mines in British Columbia, more specifically the mines known as the Silver King, Kootenai, Bonanza, American Flag, and Kohi-noor, situated on Toad Mountain, West Kootenai. No shares have been offered to the public nor any particulars made known.

At the first statutory meeting of the California Mining and Milling Company, held June 7th, it was announced that the report of Mr. J. H. Collins on the property was not yet ready, but that the unofficial preliminary report was very encouraging.

In accordance with the resolution passed at the last meeting of the Palmarejo Mining Company, Mr. William Frecheville, of London, is being sent out as a mining expert to examine and report on the mines and property of the company, and to determine whether the mines can be worked on a paying basis.

The report of the DeLamar Mining Company for the year ending March 31st, 1893, is very satisfactory. There is a credit balance of £175,300, of which £90,000 has been paid in dividends at the rate of 22 1/2%. A sum of £3,000 has been set aside out of revenue for renewals of machinery and £15,000 has been placed to the credit of capital account against the acquisition of adjoining claims. The production of gold was 19,023 oz. fine and of silver 487,137 oz.

The Mexican Gold and Silver Recovery Company, Limited, has been formed in London to acquire the McArthur-Forest cyanide process patent rights for Mexico and to carry on the process in Mexico. The capital of the company is £200,000, of which 125,000 shares of £1 each are being offered to the public. This company and its prospects will be referred to in another article, and nothing further need be said here.

DIVIDENDS.

Elkhorn Mining Company, dividend of thirty-seven and one-half cents per share, \$65.625, payable June 23d at the office of the company, No. 6 Drapers' Gardens, London, E. C., England.

Horn Silver Mining Company, dividend of twelve and one-half cents per share, \$50,000, and an extra dividend of seven and one-half cents per share, \$30,000, payable June 30th, at the office of the company, No. 56 Broadway, New York City.

Iron Mountain Mining Company paid June 12th a dividend of three cents per share, \$15,000.

Napa Consolidated Quicksilver Mining Company, dividends Nos. 54 and 55, of ten cents each per share, aggregating \$40,000, payable July 1st at the office of the company, No. 70 Kilby street, Boston, Mass.

North Star Mining Company, dividend No. 9, of fifty cents per share, \$50,000, payable June 22d at the office of the company, 18 Wall street, New York City.

MEETINGS.

Montreal Mining and Smelting Company, at the office of the company, No. 116 Social Hall avenue, Salt Lake City, Utah, June 28th, at 12 o'clock noon.

North Belle Isle Mining Company, at the office of the company, rooms 15 and 17, No. 310 Pine street, San Francisco, Cal., June 28th, at 12.30 p. m.

Oseola Gravel Mining Company, at the office of the company, No. 117 Southwest Temple street, Salt Lake City, Utah, June 28th, at 11 a. m.

West Consolidated Virginia & California Gold and Silver Mining and Milling Company, at the office of the company, No. 324 Pine street, room 8, San Francisco, Cal., June 28th, at 1 p. m.

METAL MARKET.

NEW YORK, Friday Evening, June 23, 1893.

June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
17	4 86 3/4	38 1/2	83	642	21	4 83 1/4	38 1/2	81 1/4	628
19	4 84	38 1/2	83 1/2	643	22	4 85 1/2	38	81 1/4	630
20	4 83 1/2	38 1/2	82 1/2	641	23	4 85	38	81 1/2	630

Silver has been unsettled, with downward tendency. Buyers awaiting report of the English government's special committee on silver question. Report promised in a few days.

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

Gold and Silver Exports and Imports at New York, Week Ending June 17th, 1893, and for Years from January 1st, 1893, 1892.

Week....	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
1893.....	\$14,517	\$111,746	\$807,815	\$70,679	\$640,237
1892.....	68,839,805	5,927,848	14,636,311	1,217,378	76,220,870
1892.....	34,416,692	6,168,015	10,873,731	706,195	38,416,213

The exports of gold were to the West Indies; the silver went to London. The imports were from South America and West Indies.

During the week ending June 23d, \$500,000 in American eagles was imported from London by

Baring, Magoun & Co. : small imports were also received from the West Indies and South America. The exports of gold were small and unimportant. The exports of silver showed a falling off from those of the previous week.

NOTES OF THE WEEK.

The most important events of the week have been the hurry in foreign exchange, the importation of \$500,000 in gold and the notice that the Treasury Department would pay on June 26th the interest on Government bonds due July 1st.

As we have elsewhere pointed out, the importation of gold from London was the direct result of a temporary panic in the exchange market; a number of grain bills and sterling loan bills drawn against bankers' credits being forced upon the market at a time when there were no buyers; exchange broke to 483, which permitted the importation of gold at a profit. An easier money market due to the sale of these bills, the announcement that several banks had taken out clearing-house certificates, thereby releasing an equal amount of currency, and the fact that the Government intended to anticipate payment of interest, caused a sudden rise in the rate of exchange and importations ceased immediately. This result was further brought about by the increase in the rate for fine bars, the increase being 3/4d., to 77s. 10d.; the rate for coin remaining at 76s. 9d.

The advance payment of interest ordered by Secretary Carlisle will release \$7,500,000, of which \$4,000,000 will probably be paid in New York. This action on the part of the Treasury will make the rates for money still easier, which will be of great advantage to borrowers, but at the same time will postpone the importation of gold. The demand of the middle West for currency has greatly fallen off, and it is more than likely that a return flow will start in before the next two weeks. There was, however, during the last half of the week, a sudden demand from California for a considerable amount. In fact, the indications at present are that no further importation of gold will take place for some time to come. In further proof of this we would call attention to the fact that during July a large amount of money, interest on Government bonds, railroad bonds and other securities, must be paid to Europe. This sum will probably aggregate \$7,000,000. There will also fall due interest on foreign capital loaned here on sterling loans and mortgage loans to the amount of about \$5,000,000. In all likelihood the sums so falling due will be loaned here on either short time or call and may even, in case the Sherman bill be rep-aled, find permanent investment, but such loans will prevent the importation of gold for the present.

The World's Congress Auxiliary Convention of Bankers and Financiers opened its session at the Art Palace, Chicago, June 20th. President Lyman A. Gage, of the First National Bank of Chicago, chairman of the convention, welcomed the delegates. In his opening speech he said: It is a most appropriate time for the present Congress to meet. Nature's all-powerful protest against the fallacious methods of finance have been manifested in the vast wave that has just swept over, not only this land, but the whole world, bringing ruin to many and anxiety to millions more. Following this the Hon. Charles Parsons, of St. Louis, was made permanent chairman.

On behalf of the local bankers the delegates were welcomed by President J. J. Odell of the Union National Bank. A special conference of bank examiners, both State and National, was held at 2:30 p. m., and at the same time the congress of Boards of Trade convened with William T. Baker in the chair. George F. Stone, secretary of the Chicago Board of Trade, gave the opening address. In the evening there was a general union meeting of the commerce and finance congresses in the Hall of Columbus. At this meeting the principal address was made by Mr. Horace White, of New York, the subject being "The Single Gold Standard." Mr. White was followed by Mr. E. W. Middaugh, general counsel of the Grand Trunk Railroad, on "Railway Strikes," and Dr. Charles C. Bobbough, of Maryland, who spoke of "Life Insurance Progress."

The Convention met again on the 21st with an increased attendance, notwithstanding the warm weather. Mr. P. F. Buller, of Idaho, spoke on the silver question, declaring himself to be thoroughly in favor of free coinage, and said that the recent panic was caused by the gold basis. He advocated the withdrawal of both gold and paper money (certificates) of less denomination than \$5 from circulation. Papers were read by Mr. T. C. Sherwood, of Michigan; Mr. P. W. Peoples, of Mississippi, and Mr. L. B. Stevens, of Missouri, on the conditions of the banking business in their States. Mr. J. W. Yates, of Omaha, Neb.; Mr. T. H. Wilson, of Ohio, and Mr. J. C. Post, of Oklahoma, also read papers. In the evening a union meeting was again held. Addresses were delivered on "The Commercial Need of a Sound System of Money and Banking," by Congressman J. H. Walker, of Massachusetts; "The Protection of Public Rights and Interests in Connection with Railway Operations," by Interstate Commerce Commissioner Veazey, and on "Life and Accident Insurance Combined," by J. G. Patterson, Connecticut.

At a meeting of June 22d Mr. S. Davis Page read a paper on the "Progress and Present condition of Banking in the Keystone State." Mr. Mayor Campbell, of Indiana, spoke on the "Functions of Banks," and Mr. H. S. Ballou, of Massachusetts, spoke on

"Measures of Municipal Credit." At the evening session addresses were delivered by: R. M. Widney, of Los Angeles, Cal., on "The Essential Elements of a Monetary System"; by John W. Cary, General Counsel of the Chicago, Milwaukee & St. Paul Railway, on "Governmental Regulation of Transportation and Its Practical Effects"; by William R. Tucker, Secretary of the Philadelphia Board of Trade on "Boards of Trade: Their History and Utility"; and by R. A. McCurdy, President of the New York Life Insurance Company, on "Legitimate Profit in Life Insurance."

At the evening session to-day, our Mr. Rothwell will read a paper on "An International Monetary Clearing-House."

During the week the Treasury Department has redeemed nearly \$6,000,000 worth of gold certificates; the amount now outstanding being about \$97,000,000. This has added considerably to the gold reserve, which is now about \$95,000,000. The cash surplus of the Treasury on June 22d, was \$120,592,450, of which \$12,050,000 was on deposit in national banks; \$11,663,101, consisted of subsidiary silver, and \$395,333 of minor coin and fractional paper. The receipts for the present fiscal year up to June 20th have been \$377,500,000 and expenditures \$386,000,000, which shows a deficit of about \$8,500,000. There is little reason to believe that this sum will be made up within the month and it consequently appears certain that for the first time in many years the Treasury statement will show a loss.

Mr. Preston, acting director of the Mint, has completed his purchases of silver for the month of June and fiscal year, and no more will be bought until Monday, July 3d. On Wednesday of this week purchases of 100,000 oz. were made at 82-40 cents, which is about the lowest price recorded.

On Thursday commercial bar silver dropped to 81 5 cents per oz., the lowest price on record. In London the nominal price was 38d. per ounce.

The weakness of the London silver bullion market is attributed to the forthcoming report of Lord Hershell's Indian Coinage Commission, which will be published simultaneously in England and India on Monday next. It is now thought that the report will advocate: The stoppage of silver coinage in India for private account; the imposition of a duty on silver imported into India, and the governmental regulation of rupee exchange.

A cable to Dow, Jones & Co. states that the Bank of England has advanced its nominal buying price for American gold to 76s. 6d. per ounce. The selling price remains at 76s. 9d. Bar gold is being taken at 77s. 10d. for the Continent.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$61 1/4	\$65
Peruvian soles and Chilean pesos.....	58 1/2	59 1/2
Victoria sovereigns.....	4.85	4.88
Twenty francs.....	3.86	3.89
Twenty marks.....	4.71	4.78
Spanish 25 pesetas.....	4.80	4.85

Copper—Rather more business has been done this week than last, but the market is still exceedingly sensitive. The rather sharp advance in London affected the market here; and while a few days ago not more than 10-60 was bid for Lake, several transactions have now to be reported at 10 1/2, at which price there were sellers over. There were current some reports, originating in Boston, that large sales of Lake for export had been made at 11c., but unfortunately the facts do not bear this out nor the additional rumor that all 10 1/2c. copper had been cleared out of the market and none was to be had except at 11c. For electrolytic the market has been somewhat firmer and several sales have been consummated at 10-30@10-40c., but, at the time of writing, there are no buyers thereat. Casting copper is, relatively speaking, very firm, and this because of the scarcity of furnace material owing to the contracts that have been closed for such material for export; we have to advance the price to 10 1/4@1 1/4. Arizona pig copper is in very good demand, and while early in the week sales were made, first at 9-30 and then at 9%, the latter figure has now been refused, and 9-12 named as the lowest selling price. Exports of fine copper continue to be very large indeed.

A strong buying movement set in in London and prices quickly advanced to £45 for spot and £45 10s. for three months, most of the purchases being made by financially strong speculators. At the close there is a slight easing off, prices being from 5s. @ 7s. 6d. per ton lower than those herein named. In comparison with the large business done in Chili bars, there was but little done in refined and manufactured which we quote as below: English Tough, £47 10s. @ £48; Best selected, £49 @ £49 10s.; Strong Sheets £55 @ £56; India Sheets, £52 10s. @ 53; Yellow Metal, Sheets, £43 1/2. Statistics are cabled from abroad as showing a decrease, during the first half of the month of 900 tons.

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

To Rotterdam—	Copper.	Lbs.	
S. S. Maasdam (additional)	180 casks	235,000	\$21,570
" "	818 pkgs	112,193	12,341
" "	338 casks	43,500	55,238
S. S. Amsterdam.....	1,502 pigs	408,663	40,300
" "	1,433 bars	224,782	27,331

To Antwerp—	Copper.	Lbs.	
S. S. Lepanto.....	27 casks	33,750	\$3,700
To Havre—	Copper.	Lbs.	
S. S. Charles Martil.....	510 casks	674,500	\$77,632
To Swansea—	Copper matte.	Lbs.	
S. S. Monomoy.....	94 casks	135,775	\$6,000
To Liverpool—	Copper matte.	Lbs.	
S. S. Aurania.....	6,382 bags	611,311	\$25,200
" Britannia.....	1,219 bags	112,590	6,000
" ".....	172 casks	217,291	11,010
" ".....	3,009 sacks	523,946	12,000
" Arizona.....	4,215 bags	473,261	20,000
To Bristol—	Copper.	Lbs.	
S. S. Welis City.....	723 pigs	208,749	\$21,600
To Hamburg—	Copper.	Lbs.	
S. S. Wieland.....	41 casks	51,250	\$1,700
" Sneyia.....	567 bars	173,528	57,000
" ".....	25 casks	22,400	2,575
To Stettin—	Copper.	Lbs.	
S. S. Bohemia.....	495 bars	67,255	\$7,310
" ".....	351 plates	44,893	4,938

Tin has been rather firmer, and by the middle of the week up to 20-20 for spot had been paid. Then came a slight reaction with sales made at 20-10 for spot, 20-25@20-35 for July and 20-55 for August, the close being at 20 for spot, 20-15 for July and 20-50 for August.

As shipments from the other side have ceased, the quantities that are already here and those which have still to arrive will govern the market for some time to come.

In London spot has been firmly held, and 89 was paid for prompt delivery, 86 for three months prompt.

During this month, and perhaps next, shipments from the East will be very light.

Lead. The great stringency in the money market has further unfavorably affected lead, the price for which is now lower than for ten years past, as after touching 3-60 some sales were made at 3-55 and one even at 3-1/2, the lowest price recorded. The inquiry is now somewhat better and nothing is to be had at below 3-55@3-60, at which prices there are absolutely no buyers of forward deliveries. It certainly looks as if purchases made now would turn out well.

In the foreign market there has been a quite considerable improvement, and prices for Spanish have advanced to £9 10s., and for English to £9 12s. 6d., at which figures there have been large transactions.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Lead continues to decline; last sales are at 3-35c. Buyers are scarce and the majority of them still think lead too dear.

Spelter is dull and neglected. Several failures in the Pittsburg (Pa.) district have made the galvanizers careful to order only what they actually need in order that they may not be too much engaged. The Western coal miners' strikes are still unsettled, which probably accounts for the absence of pressure to sell; had there been any we would have to quote a lower closing figure than 4-20@4-25, New York.

In London good ordinaries are quoted at £17 12s. 6d., and specials at £17 15s.

Quicksilver.—This market continues quiet. Prices have advanced slightly and quotations to-day are: New York, \$40; London, 46 17s. 6d.

Antimony is rather dull; Cookson's at 10 1/2; L. X. at 10 1/4, and Hallett's at 9 1/2.

Nickel is unaltered.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 23, 1893.

Pig Iron Production.

Fuel used.	Week ending		From Jan., '92	From Jan., '93.
	June 23, 1892.	June 23, 1893.		
Anthracite.....	77	33,738	71	33,699
Coke.....	143	128,169	139	133,625
Charcoal.....	46	11,373	34	8,391
Totals.....	266	173,282	244	175,715

Pig Iron.—Great dullness prevails in the pig iron market; everything is as quiet as it can possibly be and orders of any consequence are the exception. Consumers are busy inventorying and arranging their affairs before July 1st, and this, in addition to the continued financial stringency, has helped to make trade even quieter than it was a fortnight ago. Reports from the Lake Superior iron range indicate curtailment of production. Fuller information on this point will be found in our mining news columns. With furnaces going out of blast and iron and steel mills shutting down, the prospects are for a reduced output.

A dispatch from Pittsburg says: The first conference of the Joint Committee of Amalgamated Workers and the manufacturers to fix a scale of wages for the ensuing year has resulted in a serious disagreement. Two long sessions, the second lasting until midnight, were held by the steel sheet manufacturers and their workmen on the 20th inst., and when there was a final adjournment it was without having reached a settlement, and without any arrangement for a further consideration of the matter.

In this market there are no new features to report. Prices are without change and we do not hear of any great disposition on the part of the furnace men to force their product on the market. We quote: Northern brands: No. 1, \$14.50@15.25; No. 2, \$13.75@14.50; Gray Forge, \$12.50@13.00; Southern: No. 1, \$14@15; No. 2 F., \$13@13.50; No. 1 soft F., \$13.25@14; Gray Forge, \$12@12.05

Statement of shipments of anthracite coal for month of May, 1893, compared with corresponding period last year, compiled from the returns furnished by the mine operators:

Regions.	May, 1893. Tons.	May, 1892. Tons.	Difference.
Wyoming region.....	2,111,143	2,031,042	Inc. 79,101
Lehigh region.....	617,739	518,243	Inc. 99,496
Schuylkill region.....	982,199	972,412	Inc. 9,787
Totals.....	3,707,081	3,524,777	Inc. 182,304
	For year.	For year.	Difference.
Wyoming region.....	9,528,507	8,488,879	Inc. 1,039,628
Lehigh region.....	2,673,257	2,269,870	Inc. 403,387
Schuylkill region.....	4,703,477	4,793,171	Dec. 89,694
Totals.....	16,905,241	15,551,920	Inc. 1,353,321

The stock of coal on hand at tidewater shipping points May 31st, 1893, was 877,014 tons; on April 30th, 1893, 970,888 tons; decrease, 93,874 tons.

PRODUCTION OF BITUMINOUS COAL for week ending June 17th and year from January 1st:

Shipped East and North:	1893.		1892.
	Week.	Year.	Year.
Phila. & Erie R. R.	1,539	41,128	40,607
Cumberland, Md.	78,881	1,819,686	1,655,202
Berkey, Pa.	872	29,322	95,374
Broad Top, Pa.	11,285	336,967	272,962
Clearfield, Pa.	76,830	2,001,080	1,795,231
Allegheny, Pa.	21,602	615,252	566,469
Beach Creek, Pa.	24,781	764,774	1,186,156
Pocahontas Flat Top.	47,473	1,365,749	1,059,768
Kanawha, W. Va.	48,745	1,466,611	1,139,832
Total	311,747	8,473,692	7,892,531

Shipped West:	1893.		1892.
	Week.	Year.	Year.
Pittsburg, Pa.	25,879	611,945	646,686
Westmoreland, Pa.	37,857	959,330	737,110
Monongahela, Pa.	28,465	343,819	262,905
Totals	92,101	1,915,095	1,646,701
Grand totals.....	403,848	10,388,697	9,539,232

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending June 17th, 1893, and year from January 1st, in tons of 2,000 lb.: Week, 87,666 tons; year, 2,551,098 tons; to corresponding date in 1892, 2,600,814 tons.

Anthracite.

The anthracite coal trade continues quiet in so far as new business is concerned. The reports of heavy shipments and deliveries which are making refer chiefly, if indeed not altogether, to old business and to orders booked in May at May prices. New orders and June prices are the exceptions and little buying is being done.

The only new feature of the week has been the talk of an advance in prices on July 1st, and on this subject opinions are divided. It is stated, and there seems to be some foundation for the statement, that the more prominent coal companies have practically agreed to an advance in the price of all-rail line shipments; the fact that these prices were left unchanged last month, when the June advance in tidewater prices took place, is adduced in support of the strong probabilities which exist that the rumored raise will really occur. On the other hand it is said that tidewater prices will also undergo an upward movement; that the Eastern market is well able to stand it, since it was able to do last year. In this connection it is well to bear in mind that last year was an exceptional one in the anthracite trade and that this year the financial disturbances which the country is experiencing are not calculated to dispose minds to pay more for any article than is absolutely necessary.

That, despite the large output, there should be comparatively small stocks of coal on hand is accounted for by the heavy consumption during the severe past winter. Many of the best informed sellers are of the opinion that this year will see a heavier production than 1892. "And if we don't put up the price," they say, "it is certain the public won't." It remains to be seen whether the conditions which last year rendered possible unanimous action on this matter will prevail again this year.

Western business has been disappointingly slow and the projected advance to take place in July is designed to stir up buyers in that section of the country. Actual selling prices are 15@20c. below the official schedule, which is as follows:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash.....	\$1.00	\$1.10	\$1.40	\$4.40
Free white ash.....	3.90	4.00	4.10	4.40
Shamokin.....	4.35	4.60	4.40	4.40
Schuylkill red ash.....	4.35	4.75	4.55	4.55
Lykens Valley.....	5.00	5.65	6.00	5.25

Pea, \$2.75; No. 1 Buckwheat, \$2; No. 2 Buckwheat, \$1.50.

The Reading Railroad system reports that its coal shipment (estimated) for last week, ending June 17th, was 320,000 tons, of which 40,000 tons were sent to Port Richmond and 55,000 tons were sent to New York waters.

The Reading company has continued to purchase the output of the independent producers on the basis of 60% of the actual tidewater price. The proposed plan of rehabilitation has, however, fallen through, and the future of the company looks dark just now.

Coxe Bros. & Co., the well known coal operators have put all their interest in corporate form. Charters have been granted at Harrisburg to the "Cross Creek Coal Company," capital \$1,000,000, which will conduct the mining operations. "Coxe Bros. & Co.," capital \$250,000, will have charge of the selling of the product, and the "Coxe Iron Manufacturing Company" will look after the work and repair shops, etc.

Bituminous.

There is very little of interest to report of this market; the trade is dull. Orders are scarcer than producers like, but this is natural enough at this season of the year. Some shippers are able to dispose promptly of coal on the way, but they are the exception rather than the rule. Coal in transit to shipping ports by way of the Pennsylvania Railroad has been delayed somewhat by the large quantity of coal which is already en route. It has not amounted to a blockade yet, but it seems to be nearing one.

The car supply has been good so far despite the slow movement of coal in transit to which we have alluded. The demand for cars by shippers is small.

The New England contracts, of which we spoke in our last week's market report, have not been awarded yet.

The poorer grades of coal are having a harder time than the better grades in so far as concerns the getting of orders. There has been no cutting of prices in the best grades. From \$3.30 down to \$3 is quoted, according to quality. Through rates from the mines to shipping ports have been maintained, and it is not to be expected that while this continues any lower prices will be made on coal.

Ocean freight rates are quoted as follows from Baltimore, Norfolk, Newport News and Philadelphia: To Boston, Salem, Portsmouth, Portland and Bath, 85@90c.; Sound ports, 75c.; Wareham, \$1.05; Lynn, \$1.00@1.20; Newburyport, \$1.10; Gardiner, \$1 and towages. Vessels are in fair supply, and a large fleet is now on the way from Eastern ports. Large vessels are more plentiful than smaller ones. The vessel market is somewhat demoralized, and the anomaly was seen during the past week of charters to Saco being made at \$1.15 from Baltimore, \$1.20 from Norfolk and \$1.25 from Philadelphia.

Barges in New York harbor shipping ports are in better supply, and the demand for coal at those points is not good.

It is reported that a number of coal and coke companies in the Flat Top region have effected an important deal with the Illinois Steel Company, of South Chicago, by which arrangement that corporation will be furnished a large percentage of its coke from that section.

Boston.

June 22.

(From our Special Correspondent.)

There continues to be very little doing in hard coal. Dealers are still waiting for lower freight rates, and when they come more business can be expected. Dealers do not seem to be at all apprehensive of any advance by the companies. Stocks of hard coal held by New England dealers cannot be other than moderate if not light, so little buying has been done of late.

Prices quoted here are those net f. o. b. New York: Stove, \$4.40; egg, \$4.00; free broken, \$3.90; chestnut, \$4.40; Lykens Valley (at Philadelphia), broken, \$4.75; egg, \$5.40; stove, \$5.75; chestnut, \$5.00.

In soft coal there is very little doing. The sales continue as small as we last stated. Prices are unchanged: Cumberland, \$3.75@3.80; New River and Pocahontas, \$3.70@3.75; egg, and Clearfield, \$3.50.

Freight rates are unchanged. They are: From New York, 70c.; from Philadelphia and Baltimore, 90c.; from Newport News, 80c.; to Sound points, 75c.

In a retail way trade is very limited. That trade we noted in the past few weeks being incident on the departure of many Boston people to their summer residences is now practically over. What other trade there has been of late was light.

Dealers continue to maintain prices. We quote: Stove, \$6.25; nut, \$6.25; egg, \$6.00; furnace, \$5.75; Franklin, \$7; Lehigh egg, \$6.25; Lehigh furnace, \$6; soft coal, \$4.25.

Buffalo.

June 22.

(From our Special Correspondent.)

The anthracite coal trade quiet and without features worth noting. Bituminous coal in good demand and firm; supply adequate for all requirements, whether of propellers, tugs or manufacturers.

Dealers are filling May orders for anthracite, and occasionally new orders at June quotations.

Many vessels leave this port daily light, as the tonnage is largely in excess of that needed for coal cargoes. Rates to Lake Superior ports have advanced to the old 30c. figures, but no increase was paid for Lake Michigan and other ports.

In a few weeks the southern part of Buffalo will be supplied with fuel gas from five wells just outside the city line at Limestone Hill, and West Seneca. A company has been organized with \$300,000 capital. About 5,000,000 cubic feet of gas can be furnished daily. The limit of price is fixed at 25c. per 1,000 cubic feet.

The matter of the supply of anthracite coal or gas for the water-works of our city was deferred for two weeks. Some of our aldermen wished to buy bituminous coal, but the citizens objected strongly to the smoke nuisance that would be created. Yesterday it was agreed to continue the use of natural gas for the current year.

The following bids were received for anthracite coal for the Police Department yesterday, but the award was not made: Messrs. Roedke Bros. grate, \$4.25; egg, \$4.35; stove, \$4.40, and nut, \$4.40; Messrs. Joseph E. Gavin & Co., grate, \$4.50; egg, stove and chestnut, \$4.75; Messrs. W. H. Linderman & Co., grate, \$4.70, and egg, stove and chestnut,

\$4.96, and Mr. W. A. Robinson, grate, \$4.73; egg, nut and stove, \$4.97; all per net ton screened and delivered.

A large force of men are still employed night and day on the burning coal of the Reading trestle. The elements are slowly accomplishing the destruction of the fuel. About 10,000 tons have been saved thus far, and probably 3,000 tons more may be secured. It seems impossible to quench the fire, and the pile is so large that it will hold the heat for many weeks. It is 12 days since the fire, and the heat was greater yesterday than at any time since the disaster occurred. The trouble has not interfered with the company's contracts; the necessary supply has been taken from other distributing centres.

The shipments of coal by lake westward from Buffalo for the week ending June 17th were 73,111 net tons, distributed as follows: 37,865 tons to Chicago, 10,360 to Milwaukee, 6,960 to Duluth, 3,700 to Superior, 1,875 to Toledo, 1,700 to Saginaw, 1,300 to Gladstone, 945 to Cheboygan, 2,150 to Green Bay, 2,100 to Racine, 1,700 to Bay City, 750 to Marquette, 1,050 to Marinette, 350 to Oscoda and 396 to Mackinaw Island. The rates of freight were: 50c. to Chicago, Cheboygan and Portage; 60c. to Kenosha and Mackinaw Island; 55c. to Manitowoc, 60@55c. to Racine, 45c. to Milwaukee, 40c. to Saginaw, Green Bay, Marquette, Escanaba, Oscoda, Bay City, Ft. William, Maripret and St. Clair; 25@30c. to Duluth, Superior and Gladstone, and 30c. to Toledo.

Chicago.

June 22.

(From our Special Correspondent.)

Shippers generally complain of dullness in anthracite coal, and all claim from the same two causes—financial stress and the late advance in circular. Several operators here hint at a further advance in July or August. That there is a pronounced disposition to shade prices on contracts is shown in the following bids for anthracite coal for the various municipal institutions: Peabody Coal Co., grate, \$5.93; small sizes, \$6.50. O. S. Richardson & Co., grate, \$5.95; other sizes, \$6.50. Philadelphia and Reading C. & I. Co., grate, \$5.94; other sizes, \$6.50. Coxe Bros. & Co., grate, \$5.79; other sizes, \$6.10. Crescent Coal Co., grate, \$5.79; other sizes, \$6.29. Baker Bros., other sizes, \$6.35. These prices are delivered by team.

The absolute cost of delivery to the owner of teams would be not less than 35c. per ton. These bids are always published in the newspapers and opened in public and have a marked effect in determining and affecting prices of coal for all classes of trade. No sensible dealer can see why he should hold strictly to a circular price for the best cash trade, aggregating fully as great a tonnage as these contracts, as against such prices for slow paying customers whose chicanery is known and to whom tips of all kinds and descriptions have to be paid. The result of this week's work as shown in the foregoing has been that some of the shippers and operators who have lost good trade by an honest effort to maintain prices are now metaphorically marching around with a sharp axe in their hands and a small chip on their shoulder spoiling for a chance to belt out of the market, as one of them forcibly expressed it to the writer.

It will require the most stringent orders from the Eastern producers and controllers immediately to prevent utter demoralization of prices in this market, which is now at the most critical period for this season's business. Already large buyers from the country are withholding their orders until July and August in anticipation of the letting of the Municipal Water Works and one or two other large contracts, precipitating the expected cut in prices. Not only is this true of the country trade, but many of the larger dealers in the city have advised their retail customers of the situation, and delays in delivering are the consequence in expectation of the inability of even retail prices to stand the slashing in the wholesale trade. Job lots of anthracite coal are as liable to be offered on the street corners as any other merchandise on the bargain counters of department stores.

Bituminous coal is even duller than anthracite. The general advance in railroad freight rates and the feeling among operators that they must have 5c.@10c. per ton more for coal this year than last, have caused all large buyers to delay placing their contracts for ensuing year in hopes of breaking the operators' prices, or until they are fully convinced of the futility of such an attempt. Some few are already showing a little weakness in regard to their prices, fearing that an absence of orders will close their mines and scatter their miners to points where they could not secure a sufficient working force 60 or 90 days hence, when the commercial trade must of necessity be a buyer at the then current circular. The railroads are acting a double part in that they are advancing their rates to secure more revenue and trying to pound the operator down on his prices at the mines in order to reduce their operating expenses.

Coke is very quiet, and as few, if any, foundries are running full time or capacity, no revival in this specialty will be noticed until greater activity obtains in the iron trade.

Quotations are: \$4.65 furnace; \$5.05 foundry, crushed; \$5.40 Connellsville; West Virginia: \$1.90 furnace, \$4.10 foundry; New River Foundry, \$4.35; Walston: \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.25; large egg, \$5.60; small egg, range and chestnut, \$5.85. Retail prices per ton are: Large egg, \$7; small egg, range and chestnut, \$7.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.35; Hocking Valley, \$3; Youghiogheny, \$3.25; Illinois block, \$2.50; Brazil block \$2.50.

Pittsburg.

June 22.

(From our Special Correspondent.)

Coal.—As noticed in our last, trade is suffering from low water; not only coal, but freight and passenger boats on the Ohio. The mines in the Monongahela will be compelled to close unless the June rise makes its appearance speedily. The wickets at Davis Island dam are now up, making 6 ft. 6 in. in the Pittsburg harbor; this enables the coal men to bring the coal loaded in the pools to this point to be ready to depart on the first rise. The supply of coal in the Southern markets is not large; when the rise comes the bulk of the coal now loaded will go south. The weather is now rainy; the rise may be in time for our next letter.

Connellsville Coke.—Prices remains as follows, and can be relied on: Per ton of 2,000 lbs. f. o. b. at ovens: Furnace coke, \$1.75; foundry coke, \$2.15. Delivered at Pittsburg: Furnace, \$2.45; foundry, \$2.85. Freight from Connellsville to Pittsburg, 70c. per ton.

The Pittsburg and Eastern trade continues good, but Western shipments have fallen off. Western shipments got a black eye when the Illinois Steel Company cut down their order of 200 cars per day more than one-half, making a difference of over 600 cars per week. Shipments for the week aggregated 121,866 tons, distributed as follows: To Pittsburg 2,063 cars; to points east, 1,531 cars; to points west, 2,820 cars; total, 6,414 cars, making a net increase of 218 cars, 4,142 tons.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, June 23.

Heavy Chemicals.—There is no change to report of the heavy chemical market. The same conditions prevail to-day that have ruled for some weeks past. The dullness is as great as ever. There is no improvement in the demand, either for spot goods or for future deliveries. Alkali and carbonated soda ash are lifeless. Caustic soda and bleaching powder are quiet and without any features. Prices are nominally quoted as follows: Caustic soda, 60%, 29.5@31.0c; 70%, 2.70@2.80c; 74%, 2.72½@2.82½c; 76%, 2.80@2.90c. Carbonated soda ash, 48%, 1.25@1.30c; 58%, 1.20@1.25. Alkali, 48%, 1.20@1.30c; 58%, 1.20@1.25c, according to package. Sal soda, English, on the spot, 1c. American 95@

1c.; bleaching powder, 2.25@2.37½c. In special cases, carbonated soda ash and alkali will sell below the above figures.

Acids.—There is absolutely nothing new to report of the acid market. The demand keeps up as usual and there is no difficulty in supplying it. Prices are without change from last week. We quote: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, \$1.87½@2, according to quality; muriatic, 18°, 90c.@\$1.10; 20°, \$1@1.25; 22°, \$1.10@1.35; nitric, 40°, \$1; 42°, \$1.50@1.75; sulphuric, 80c.@\$1.10; mixed acids, according to mixture, oxalic, \$6.30@6.50. Blue vitriol is quoted all the way from \$3.50 to \$3.75; glycerine for nitro-glycerine, 11¼@12¼c., according to quality and quantity.

Brimstone.—This market for Sicilian brimstone continues quiet. Quotations are as follows: Best unmined seconds, on the spot \$20; to arrive, \$19.50. Thirds are 75c.@\$1 less.

Fertilizing Chemicals.—The dullness in this market reported in our last issue is as great now as it was then. Some sales at low prices are reported, but on the whole prices have not declined very much. The demand, as is usual at this time of the year, is small, and, in addition, buyers are disposed to play a waiting game in expectation of a still further decline in prices. We quote this week: Dried blood, \$2.30@2.35 per unit for high grade, and \$2.20@2.25 for low grade; azotine, \$2.35@2.40 sulphate of ammonia, \$3.15 for gas liquor; bone liquor is offering at \$3.10. Concentrated phosphate, 30% available phosphoric acid, 75c. per unit. Acidulated fish scrap, no stocks on hand; dried scrap is quoted at \$27.50 f. o. b. fish factory. The fish catch thus far has been very light. Tankage, high grade, \$27@29; low grade, \$26@28. Bone tankage, \$24@25; bone meal, \$24@25.50.

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

Phosphates.—Quotations for high grade land rock, f. o. b. Charleston, are \$4.50@4.75. Freight are \$2.25.

Muriate of Potash.—Arrivals during the past week aggregate 550 tons at this port. There are no new sales of consequence to report. The market is dull. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, \$1.78; Philadelphia, \$1.80½; Southern ports, \$1.83.

Kainit.—This market is very quiet. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, \$8.75 for foreign invoice weight and test, and \$9 for actual weight; Charleston, Savannah and Wilmington, \$9.50 for invoice weight and test, and \$9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of Soda.—There is no change to report of this market, which continues very dull. Lots on the spot are held at \$1.70.

Liverpool.

June 14.

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

The demand for heavy chemicals generally is of a disappointing character and dullness is the prevailing feature of the market.

Soda Ash.—There is little business reported and quotations are very unreliable, depending upon quantity, brand, market, etc. For Leblanc makes the nominal spot range is about as follows:

Caustic ash, 48%, £4 10s.@£5 per ton; 57-58%, £5 10s.@£5 15s. per ton, net; carb. ash, 48%, £4 15s.@£5 per ton; 58%, £5 5s.@£5 15s. per ton cash; ammonia ash, 58%, dull at £4 7s. 6d.@£4 15s. per ton less 2½%, according to quantity and make. Soda crystals quiet but steady at £2 12s. 6d.@£3 per ton less 5%.

Caustic soda is flat and orders scarce. Quotations vary considerably, according to export market, and nominal spot range is about as follows: 60%, £8@£9 per ton; 70%, £9@£10 per ton; 74%, £10@£11 per ton; 76%, £11 10s.@£12 per ton, all net cash. For parcels under 10 tons, 5s. per ton extra is charged. Bleaching powder is not active, but price remains steady at £3 10s.@£3 15s. per ton, net cash for hardwood packages.

Chlorate of potash is in a lifeless state, and nothing doing for prompt delivery. For resale parcels nearest quotations are as follows: Spot, 8½d. per lb.; July, 8½d.; possibly 8½d.; July-December, 7½@7¾d. all less 5%.

Bicarb. of soda is quiet, but makers are very fully sold, and price is firm at £6 15s. per ton, less 2½% for 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is in demand, and being in small compass, is held for full prices. Spot quotations are about £12 15s.@£12 19s. 6d. per ton for good gray 24%, and £13 per ton for 25%, both for double bags less 2½% f. o. b. here. Nitrate of soda dull at £8 15s.@£9 5s. per ton per double bags f. o. b. here, less 2½%, according to quality.

Carb. ammonia.—Lump, 3d. per lb.; powdered, 3¼d. per lb. net cash.

CURRENT PRICES.

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

Acid—Acetic, chem. pure, .17@.19 Commercial, in bbls. and cys., .01¾@.02 Carbonic, liquefied, # lb., .18@.25 Chronic, chem pure, # lb., 1.00 for batteries, .40 Hydrobromic, dilute, U. S. P., .25@.30 Hydrocyanic, U. S. P., .4@.50 Hydrofluoric, # lb., 2@.30 Alcohol—95%, # gall., .23@.24 Absolute, # lb., .33 Ammoniated, .32 Alum—Lump, # cwt., \$1.75@1.85 Ground, # cwt., \$1.85@1.90 Powdered, # lb., .04½@.05 Lump # ton, Liverpool, .45 Alumina Chloride—Pure, # lb., \$1.25 Amalgamating solution, # lb., .60 Sulphate, # cwt., \$1.90@2.50 Ammonia—sal., in bbl. lots, # lb., .07½@.08 Carbonate, # lb., English and German, .07½@.08 Muriate, white, in bbls., # lb., .08½ Aqua Ammonia—(in cys.) 18° # lb., .03@.04 20°, # lb., .04@.05 26°, # lb., .04½@.05 Antimony—Oxymur., # lb., .04@.06 Regulus, # lb., .10@.11 Argols—Red, powdered, # lb., .15 Arsenic—White, powdered, # lb., .03@.03½ Red # lb., .05@.07 Yellow, # lb., .08@.09 White at Plymouth, # ton, .£12 2 6 Asbestos—Canadian, # ton, .£50@£500 Italian, # ton, c. i. l. L'pool, .£18@£60 Ashes—Pot, 1st sorts, # lb., .475@.5 Pearl, # lb., .05½@.06 Asphaltum—Prime Cuban, # lb., .04@.05 Hard Cuban, # ton, .£28.00@£30.00 Trinidad, refined, # ton, .£30.00@£35.00 Egyptian and Syrian, # lb., .05@.07½ Californian, at mine, # ton, \$12.00@25.00 at San Francisco, # ton, \$15.00@29.00 Barium—Carbonate, pure, # lb., .45 Carbonate, crystal, # lb., .06@.10 Chloride, commercial, # lb., .05@.10 pure, # lb., .18 Iodide, # oz., .40 Nitrate, # lb., .06½@.07 Sulph., Am. prime white, # ton, \$17.50@19 Sulph., foreign, floated, # ton, \$21@24 Sulph., off color, # ton, \$11.50@15.00 Carb., lump, f. o. b. L'pool, # ton, .£6 No. 1, Casks, Runcorn, " " £4 10 0 No. 2, bags, Runcorn, " " £3 15 0 Bauxite—# ton, \$10.00 Bicarbonate of Potash—Scotch, # lb., .11@.12 American, # lb., .11@.12 Bichromate of Soda—# lb., .09½@.10 Borax—Refined, # lb., in car lots, .08@.09 San Francisco, .08@.08½ Concentrated, in car lots, .07½@.08 Refined, Liverpool # ton, .£2

Bromine—# lb., .25@.35 Cadmium—# lb., \$2.00 Cadmium Iodide—# lb., \$5.50 Chalk—# ton, \$1.50@2.25 Precipitated, # lb., .14@.06 China Clay—English, # ton, \$13@18.00 Domestic, # ton, \$9@11 Chlorine Water—# lb., .10 Chrome Yellow—# lb., .10@.25 Chrome Iron Ore—# ton, San Francisco, \$10.00 Chromalum—Pure, # lb., .35@.40 Commercial, # lb., .02½ Cobalt—Oxide, # lb., \$1.60@1.70 Copper—Sulph. English Wk. ton, \$20@21 Vitriol (blue), ordinary, # lb., .03½@.03¾ extra, .04½ Nitrate, # lb., .40 Copperas—Comm'n, # 100 lbs., .85@.95 Best, # 100 lbs., \$1.35@1.50 Liverpool # ton, in casks, \$2@2 10s Corundum—Powdered, # lb., .04½@.09 Flour, # lb., .07@.08 Cryolite—Pow., # lb., bbl. lots, .07@.03 Emery—Grain, # lb., (kg.), .04½@.05 Flour # lb., .02½@.04 Epsom Salt—# lb., .01@.01½ Feldspar—Ground, # ton, \$6.00@10.00 Crude, \$2.00@3.00 Fluorspar—Powdered, No. 1, # ton, \$20@30 Lump, at mine, \$6@8 French Chalk—Fuller's Earth—Lump, # ton, \$16@18 Glauber's Salt—in bbls., # lb., .01@.01¼ Glass—Ground, # lb., .19@.10 Gold—Chloride, pure crystals, # oz., \$12.00 pure, 15 gr., c. v., # doz., \$5.40 liquid, 15 gr., # 5.50 Chloride and sodium, # oz., \$6.00 15 gr., c. v., # doz., \$2.75 Oxide, # oz., \$27.25 Gypsum—Calcined, # bbl., \$1.25@1.50 Land Plaster, # lb., .03@.03 Iodine—Resublimed, # oz., .30@.33 Iridium—Oxide # lb., \$90 Iron—Nitrate, 40°, # lb., .01@.01¼ 47°, # lb., .02@.02½ Kaolin—See China Clay. Kieserite—# ton, \$9@10 Lead—Red, American, # lb., .06½@.07½ White, American, in oil, # lb., .08½@.07½ White, English, # lb., in oil, .08½@.08¾ Acetate, or sugar of, white, .06@.06½ Granulated, .09@.12 Nitrate, .09@.12 Lime Acetate—Am. Brown, .90@.95 Gray, \$1.75@1.87½ Litharge—Powdered, # lb., .05½@.07½ Calcined, # ton of 2,240 lbs., \$22.00 Brick, # ton of 2,240 lbs., \$47.50 Manganese—Ore, per unit, .23@.28 Oxide, ground, # lb., .02½@.06½ Mercuric Chloride—(Corrosive Sublimite) # lb., .65@.64 Powdered, # lb., .6

Muric Dust—# bbl, \$1.25@1.50 Metallic Paint—Brown # ton, \$20@25 Red, # ton, \$20@25 Mineral Wool—Ordinary slag, .01½ Ordinary rock, .02½ Ground, # ton, .02½ Tiles—in sheets according to size. 1st quality, # lb., .25@36.00 Naphtha—Black, .10@.25 Nitre Cake—# ton, \$10.00 Ochre—Rochelle, # lb., .01¼@.01¾ Washed Nat Ox'rd, Lump, # lb., .06½@.06¾ Washed Nat Ox'rd, Powder, # lb., .07½ Golden, # lb., .03@.06 Domestic, # ton, \$12@20 Oils, Mineral—Cylinder, light filtered, # gal., .14@.16 Dark filtered, # gal., .10@.13 Extra cold test, # gal., 2@.24 Dark steam refined, # gal., .07½@.12 Phosphorus—# lb., .40@.50 Precip., red, # lb., .40@.50 white, # lb., .85@.90 Platina Chloride—Dry, # oz., \$7 Plumbago—Leyton, # lb., .04@.05 American, # lb., .05@.07 67%, # lb., .44 fused, .38@.41 Bromide, domestic, # lb., .28@.32 Chlorate, English, # lb., .18@.18¼ Chlorate, powdered, English, # lb., .18½@.19 Carbonate, # lb., by casks, 82%, .04½@.06 Caustic, # lb., pure slick, .05½@.06 Iodide, # lb., \$2.58@2.80 Nitrate, refined, # lb., .06@.08 Bichromate, # lb., .10@.11½ Yellow Prussiate, # lb., .21½@.22½ Red Prussiate, # lb., .19@.21 Picnic Stone—Select lumps, # lb., .15 Original cks., # lb., .01½@.02 Powdered, pure, # lb., .01½@.01¾ Pyrites—Non-cupreous, p. units, 12@.1 Quartz—Ground, # ton, \$6.00@10.0 Rotten Stone, Powdered, # lb., .03½@.03¾ Lump, # lb., .06@.07 Original cks., # lb., .04½@.05½ Rubbing stone, # lb., .03½@.04 Sal Ammoniac—Lump, in bbls., # lb., .80½ Salt—Liverpool, ground, # sack, .70 Domestic, fine, # ton, \$7@7½ Common, fine, # ton, \$4.50@4½ Turk's Island, # bush, .26@.2 Salt Cake—# ton, \$10.00@15.00 Saltpeater—Crude, # lb., .03¼@.04 Soapstone—Ground, # ton, \$8@8 Block and slab according to size. Sodium—Prussiate, # lb., .22@.24 Phosphate, # lb., .04@.05 Stannate, # lb., .06@.12 Tungstate, # lb., .30@.35 Hyposulphite, # cwt., in cask, \$1.70 \$1.80 Strontium—Nitrate, # lb., .18½@.08 Sulphur—Roll, # lb., .01½@.0¼ Flour # lb., .01½@.02 Sylvinit, 27@35%, S.O.P., per unit, 3.75

Talc—Ground French, # lb., .01¼@.01¼ American No. 1, # lb., .01¼@.01¼ American No. 2, .006 Terra Alba—French, # lb., .65@.80 English, # lb., .6@.80 American, No. 1, # lb., .6@.80 American, No. 2, # lb., .40@.60 Tin—Crystals, in kegs or bbls., .14@.15 feathered or flossed, .20 Muriate, single, # lb., .07@.12 Double or strong, 54° B., .10@.15 Oxymur. or nitro, .19 Vermilion—Imp. English, # lb., .30 Am. quicksilver, bulk, .57@.59 Am. quicksilver, bags, .58@.60 Chinese, .85@1.00 Trieste, .90@.95 American, .11½@.12 Zinc White—Am., Dry, # lb., .04½@.05 Antwerp, Red Seal, # lb., .06¼@.07 Paris, Red Seal, # lb., .07½@.08 Muriate solution, .07½@.08 Sulphate crystals, in bbls., # lb., .03@.03¾

THE RARER METALS.

Aluminum—# lb., .80@.85 Arsenic—(Metallic), per lb., .40 Barium—(Metallic), per gram, \$4.00 Bismuth—(Metallic), per lb., \$2.00 Cadmium—(Metallic), per lb., \$1@1.50 Calcium—(Metallic), per gram, \$10.00 Cerium—(Metallic), per gram, \$7.50 Chromium—(Metallic), per gram, \$1.00 Cobalt—(Metallic), per lb., \$6.00 Didymium—(Metallic), per gram, \$3.00 Erbium—(Metallic), per gram, \$7.50 Gallium—(Metallic), per gram, \$14.00 Gadolinium—(Metallic), per gram, \$12.00 Indium—(Metallic), per gram, \$9.00 Iridium—(Fused), per oz., \$12.00 Lanthanum—(Metallic), per gr., \$10.00 Lithium—(Metallic), per gram, \$10.00 Magnesium—(Powdered), per lb., \$4.00 Manganese—(Metallic), per lb., \$1.10 Chem. pure, per oz., \$10.00 Molybdenum—(Metallic), per gm, \$5.00 Niobium—(Metallic), per gram, \$5.00 Osmium—(Metallic), per oz., \$65.00 Palladium—(Metallic), per oz., \$20.00 Platinum—(Metallic), per lb., \$25.00 Potassium—(Metallic), per lb., \$25.00 Rhodium—(Metallic), per gram, \$5.00 Ruthenium—(Metallic), per gm., \$5.50 Rubidium—(Metallic), per gram, \$2.00 Selenium—(Metallic), per oz., \$1.80 Sodium—(Metallic), per lb., \$5@.75 Strontium—(Metallic), per gm., \$6.00 Tantalum—(Metallic), per gram, \$9.00 Tellurium—(Metallic), per lb., \$5.00 Thallium—(Metallic), per gram, \$3.00 Titanium—(Metallic), per gram, \$2.20 Thorium—(Metallic), per gram, \$17.00 Tungsten—(Metallic), per lb., \$8 Uranium—(Oxide), per lb., \$5.00 Metallic, per lb., \$3.00 Vanadium—(Metallic), per gm., \$22.00 Yttrium—(Metallic), per gram, \$6.00 Zirconium—(Metallic), per gm., \$6.00

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stock Quotations, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name and Location of Company, dates from June 17 to June 23, and Sales figures.

*Ex-dividend. *Death in at New York Stock Ex. Unlisted securities. Assessments paid. A 1888-90 not paid. Dividend shares sold, 2,425. Non-dividend shares sold, 2,825. Total shares sold, 5,250.

BOSTON MINING STOCK QUOTATIONS.

Main table of Boston Mining Stock Quotations, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name of Company, dates from June 16 to June 22, and Sales figures.

Dividend shares sold, 2,664. Non-dividend shares sold, 3,455. Total shares sold, 6,119.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Detailed table of mining stock data, including Name and Location of Company, Capital Stock, Shares (No., Par), Assessments (Total levied, Date and amount of last), Dividends (Total paid, Date and amount of last), and various company details.

DIVIDEND-PAYING MINES.

NON DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, 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. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$2,960,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Kly Company which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$425,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Stock Names, June 17, June 19, June 20, June 21, June 22, June 23, and Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

Total shares sold, 277,196.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Stock Names, June 17, June 19, June 20, June 21, June 22, June 23, and Sales. Lists industrial and trust stocks with their respective prices and sales figures.

Total sales, 164,497.

CALIFORNIA. San Francisco.

Table with columns for Stock Names, June 16, June 17, June 19, June 20, June 21, June 22. Lists California stocks with their respective prices.

COLORADO. Aspen.

Table with columns for Stock Names, Bid, Asked. Lists Colorado stocks with their respective bid and asked prices.

Colorado Springs, June 17.

Table with columns for Stock Names, Bid, Asked. Lists Colorado Springs stocks with their respective bid and asked prices.

Denver.

Table with columns for Stock Names, High, Low, Sales. Lists Denver stocks with their respective high, low, and sales figures.

Bico.

Table with columns for Stock Names, Bid, Asked. Lists Bico stocks with their respective bid and asked prices.

MARYLAND. Baltimore.

Table with columns for Stock Names, Bid, Asked. Lists Maryland stocks with their respective bid and asked prices.

MINNESOTA. Duluth.

Table with columns for Stock Names, Bid, Asked. Lists Minnesota stocks with their respective bid and asked prices.

UNLISTED STOCKS.

Table with columns for Stock Names, Bid, Asked. Lists unlisted stocks with their respective bid and asked prices.

MISSOURI. St. Louis.

Table with columns for Stock Names, Bid, Asked. Lists Missouri stocks with their respective bid and asked prices.

MONTANA. Helena.

Table with columns for Stock Names, Bid, Asked. Lists Montana stocks with their respective bid and asked prices.

PENNSYLVANIA. Philadelphia.

Table with columns for Stock Names, Bid, Asked. Lists Pennsylvania stocks with their respective bid and asked prices.

London Quotations.

Table with columns for Stock Names, Bid, Asked. Lists London quotations with their respective bid and asked prices.

Paris.

Table with columns for Stock Names, Bid, Asked. Lists Paris quotations with their respective bid and asked prices.

New York Mining Stocks.

Table with columns for Stock Names, Bid, Asked. Lists New York mining stocks with their respective bid and asked prices.

ASSESSMENTS.

Table with columns for Company, No., D'tmt in office, Day of sale, Amt. per sh're. Lists assessments for various companies.

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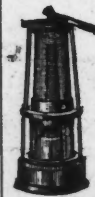
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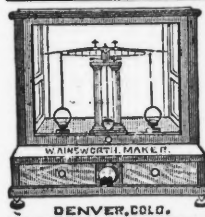
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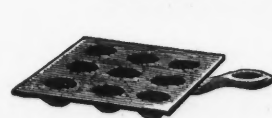
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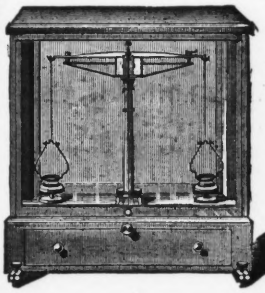


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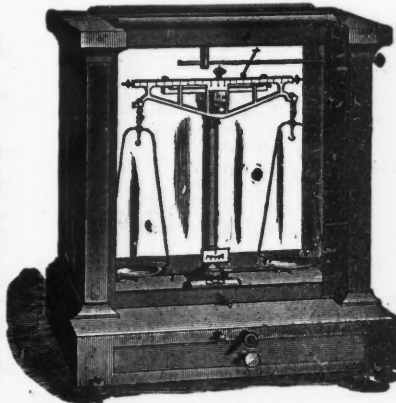
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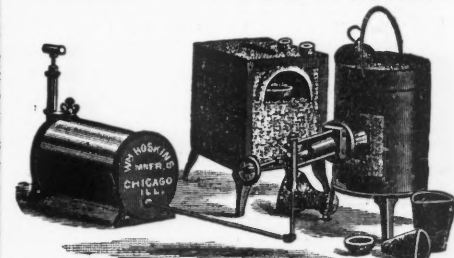
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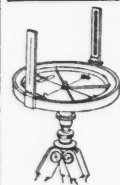
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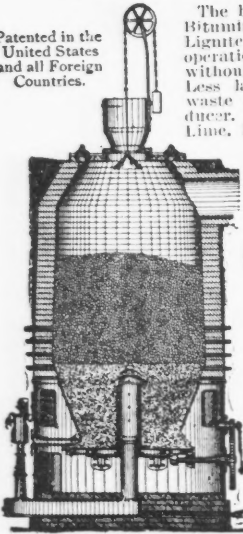
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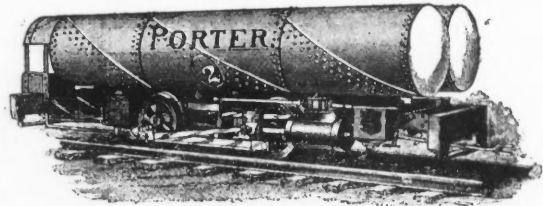
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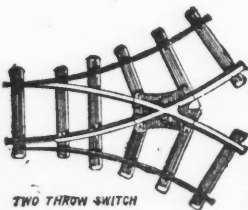
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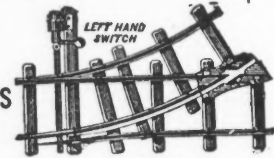
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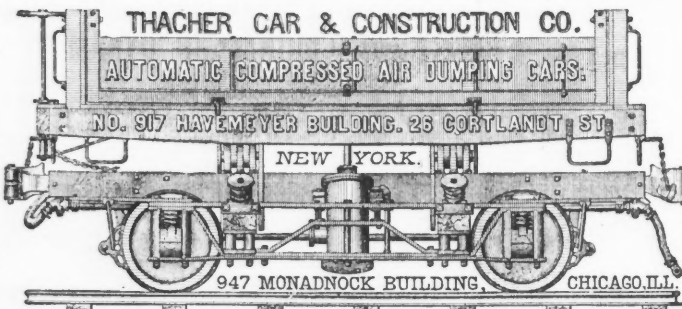
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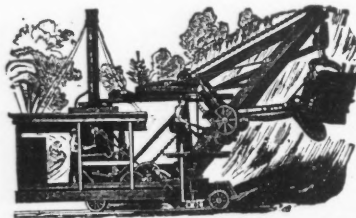
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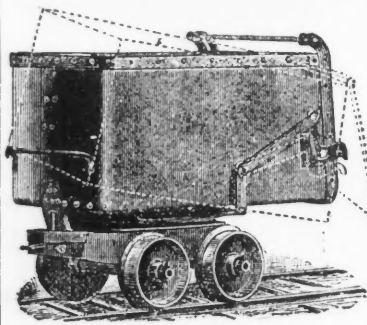


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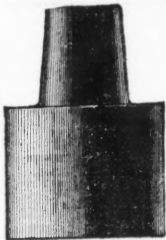
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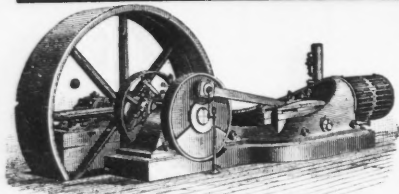
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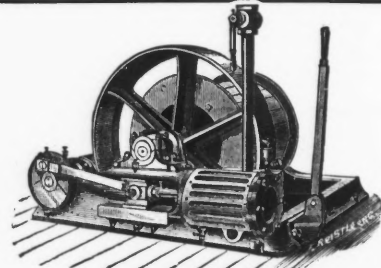


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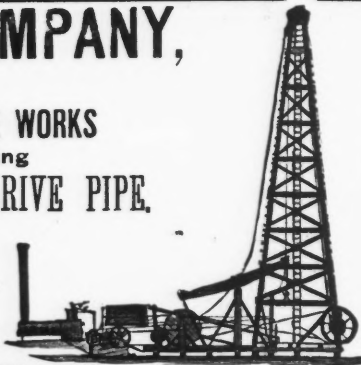
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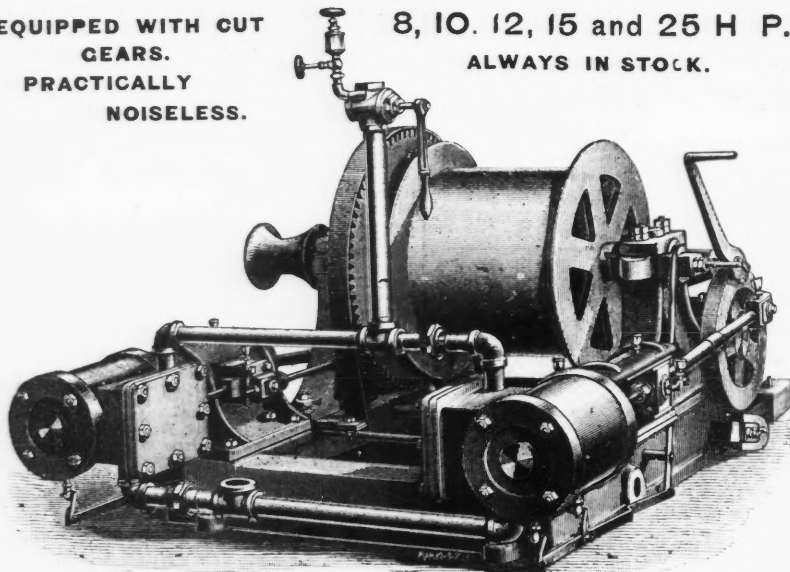
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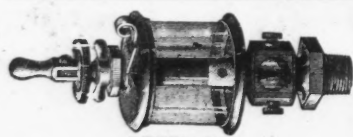
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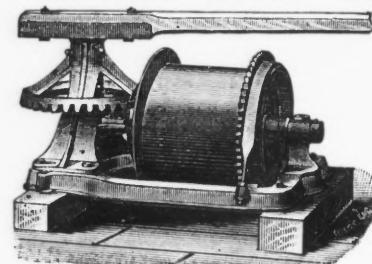
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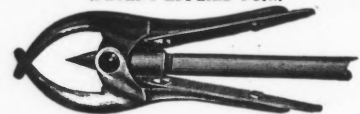
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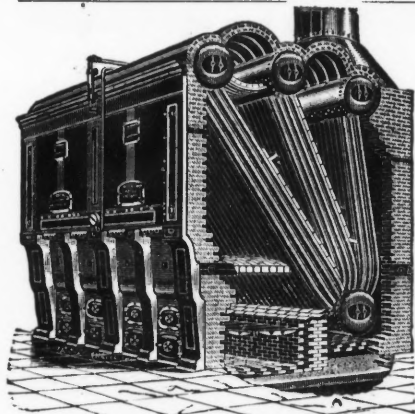
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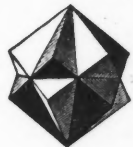
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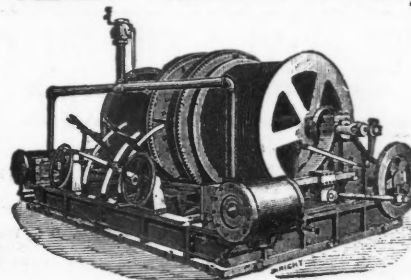
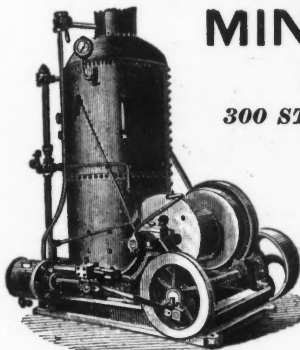
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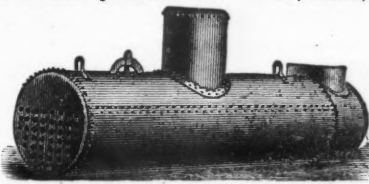


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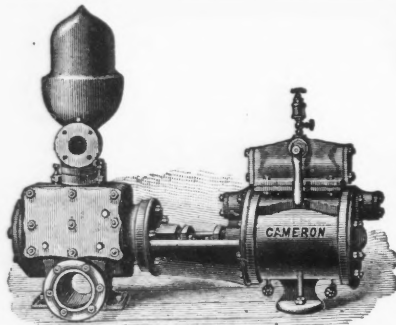
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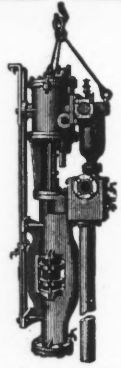


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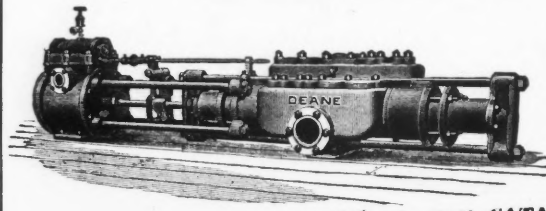
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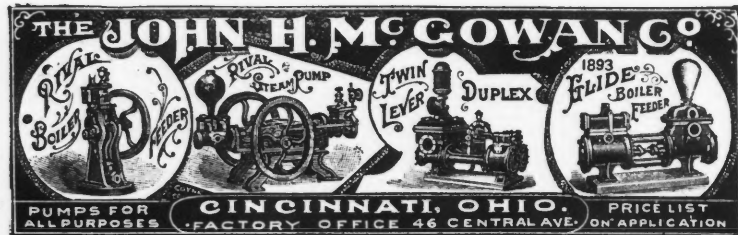
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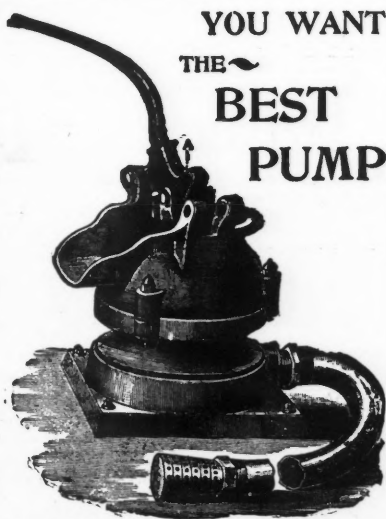
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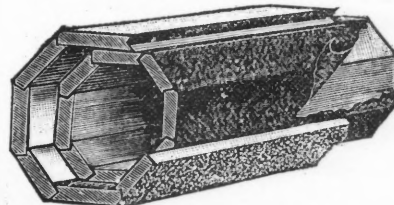


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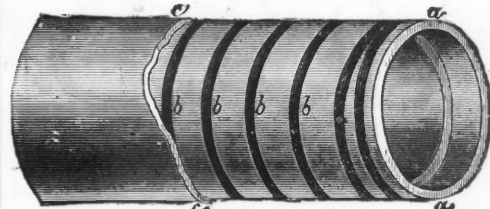
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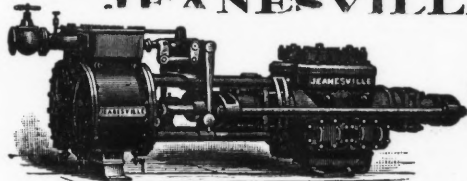
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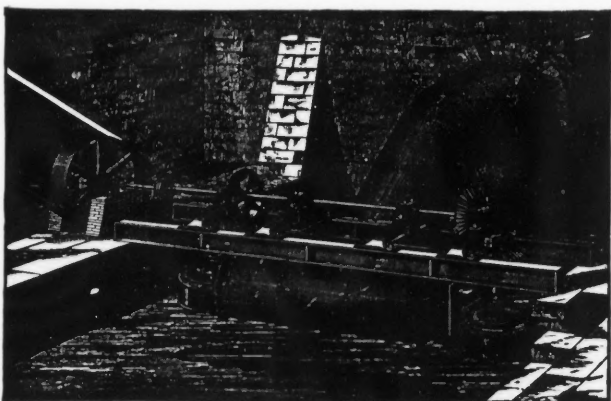
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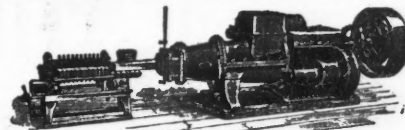
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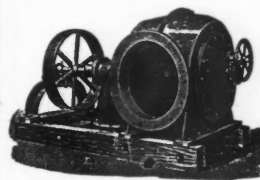
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- Indicates every other week or monthly advertisements.

Table with columns A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y. Each column lists advertiser names and their corresponding page numbers.



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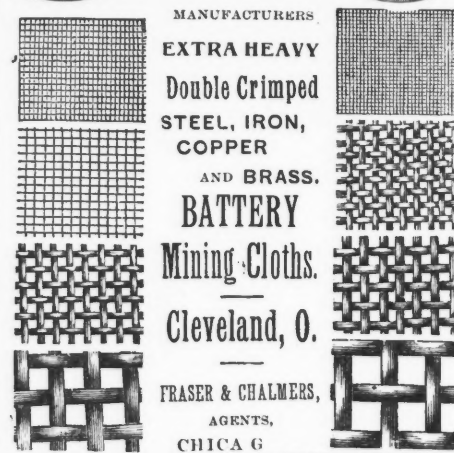


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BRIDGE.—Sealed Proposals will be received by the undersigned, at the County Commissioners' office, Fairfield County Court House, at Bridgeport, Conn., until June 29th, 1893, for furnishing all labor and material required in the construction of a pile foundation and masonry substructure, and the erection of an iron or steel superstructure (after design submitted by bidder) over the Housatonic River, between the counties of New Haven and Fairfield, on or near the site of the present bridge, known as Washington Bridge. The entire length of bridge will be six hundred and sixty (60) feet, will consist of two fixed spans, each 230 feet in length, and a draw-span of 200 feet. Plans, specifications and any information desired may be obtained at the office of Scofield & Starr, Room 2, City Hall, Bridgeport, Conn. **DANIEL M. ROWLAND, Secretary.**

DIKE WORK.—U. S. Engineer Office, 1428 Arch Street, Philadelphia, Pa.—Sealed proposals for repairing and strengthening the pile and stone dike at Bulkhead Bar, Delaware River, will be received at this office until July 5, 1893, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. **C. W. RAYMOND, Major, Corps of Engineers, U. S. Army**

DREDGING.—United States Engineer Office, Wilmington, Del.—Sealed proposals for dredging and excavating for the construction of an inland waterway from Chincoteague Bay, Va., to Delaware Bay, Del., will be received at this office until July 18th, 1893. Specifications, blank forms, and all available information will be furnished on application to this office. **WM. F. SMITH, United States Agent.**

WATER WORKS.—Sealed proposals will be received by the city of Dillon, Mont., until July 5th, 1893, for the material and labor incident to the construction of a system of water-works for the city, all proposals to be accompanied by a certified check to 10% of the amount of the bid. Plans and specifications can be seen at the office of the City Clerk in said city, or of Ray & Tingle, Engineers, Butte, Mont. **EDWIN NORRIS, City Clerk**

WATER WORKS.—Sealed proposals will be received by the Water Commissioners of Meredith Village Fire District, in the town of Meredith, N. H., until June 30, 1893. The work will consist of a reservoir of about 5,500,000 gallons capacity, covering about two and four-tenths (2 4/10) acres, and about five miles of pipe, varying in size from four (4) to ten (10) inches, requiring about 550 tons of cast iron pipe and special castings, together with about 30 gates and 33 hydrants. The earthen dam will be about 300 feet long and about 25 feet high. Specifications and plans can be seen upon application to the Water Commissioners at Meredith, N. H., or to **SAMUEL M. GRAY, Consulting Engineer, 20 Market Square, Providence, R. I.**

WATER WORKS.—Sealed proposals will be received until July 8, 1893, by the board of water-works trustees of Shreve, O., for the construction of a system of water-works in Shreve, O. Plans, specifications and contracts will be on exhibition at the clerk's office of the board of trustees after June 14th, 1893. Blank forms of plans, specifications and contracts will be furnished on application. Each bid must be accompanied by a certified check to the amount of \$ 00 as a guarantee of good faith. **DAVID E. FOLTZ, Chairman Board of Trustees.**

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NEW YORK, June 16, 1893.

DIVIDEND NO. 76.

A dividend of twenty-five (25) cents per share has been
declared for May, payable on the 30th inst.
Transfer books close on the 24th inst.

LOUNSBURY & CO., Transfer Agents.

HORN SILVER MINING COMPANY, OF

UTAH

56 BROADWAY, NEW YORK, June 17, 1893.
The regular quarterly dividend of TWELVE AND
ONE-HALF CENTS and an extra dividend of SEVEN
AND ONE-HALF CENTS a share has been declared
upon the stock of this company, payable on and after
June 30th, 1893, to stockholders of record at the close of
business June 21st.

The transfer books will close at 3 o'clock P. M., June
21st, and reopen July 1, at 10 A. M.

A. I. HARRISON, Secretary.

MOLLIE GIBSON CONSOLIDATED MIN-

ING AND MILLING COMPANY.

COLORADO SPRINGS, COLO., May 18th, 1893.

DIVIDEND NO. 35

A dividend of fifteen cents per share (\$150,000) has
been declared, payable June 15th, 1893, to stock-
holders of record on June 5th. Transfer books close
June 5th, and reopen June 16th, 1893.

PERCY HAGERMAN, Sec'y-Treas.

NORTH STAR MINING COMPANY.

18 WALL STREET, NEW YORK.
June 16th, 1893.

Dividend No. 9, of 50 cents per share (\$50,000), has been
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THE MINERAL INDUSTRY,

Its Statistics, Technology and Trade

IN THE UNITED STATES AND OTHER COUNTRIES FROM THE EARLIEST TIMES TO THE CLOSE OF 1892,

Being the Annual Statistical Supplement of the ENGINEERING AND MINING JOURNAL.

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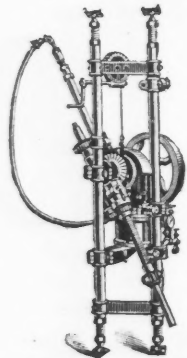
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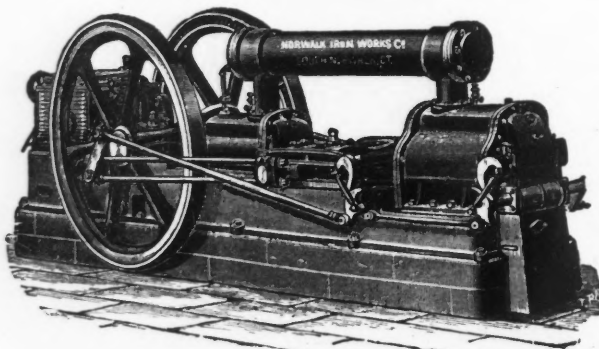
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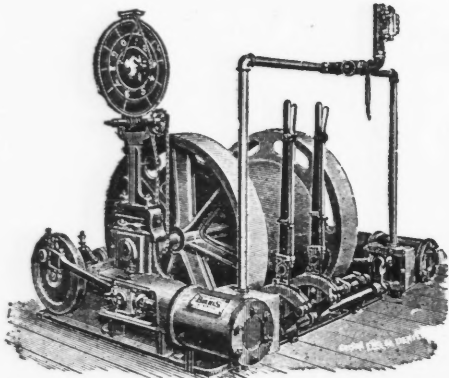
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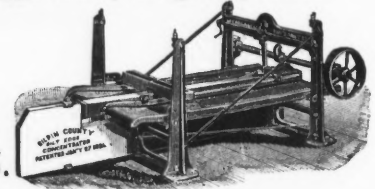
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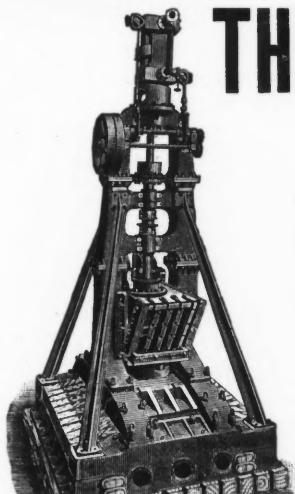
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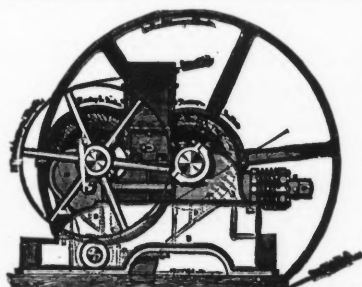
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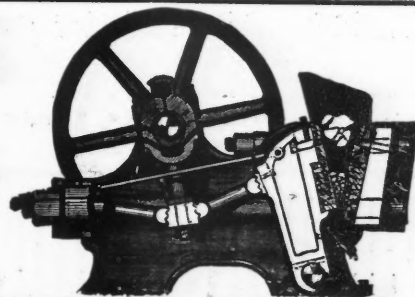
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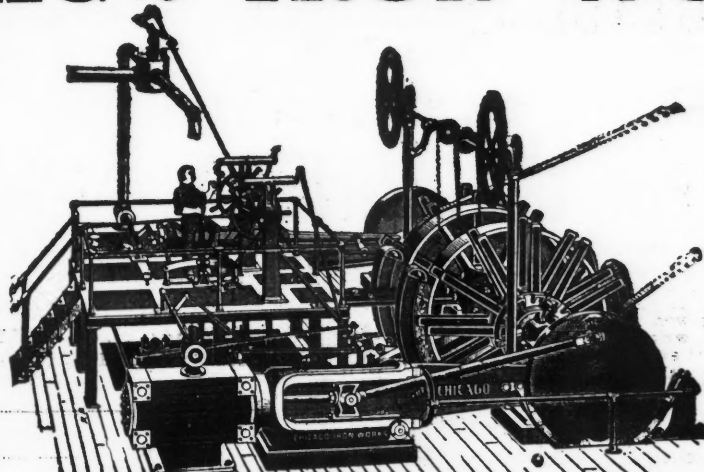
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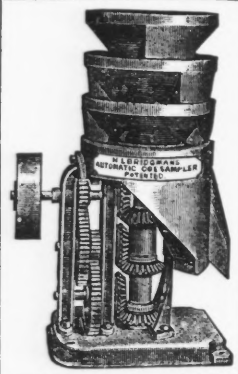
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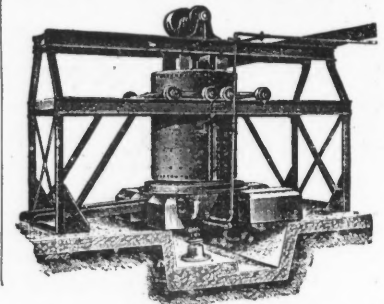
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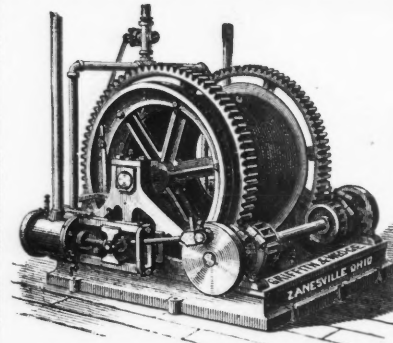
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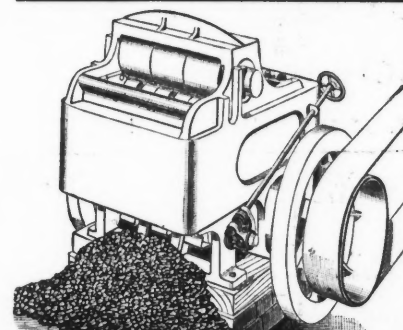
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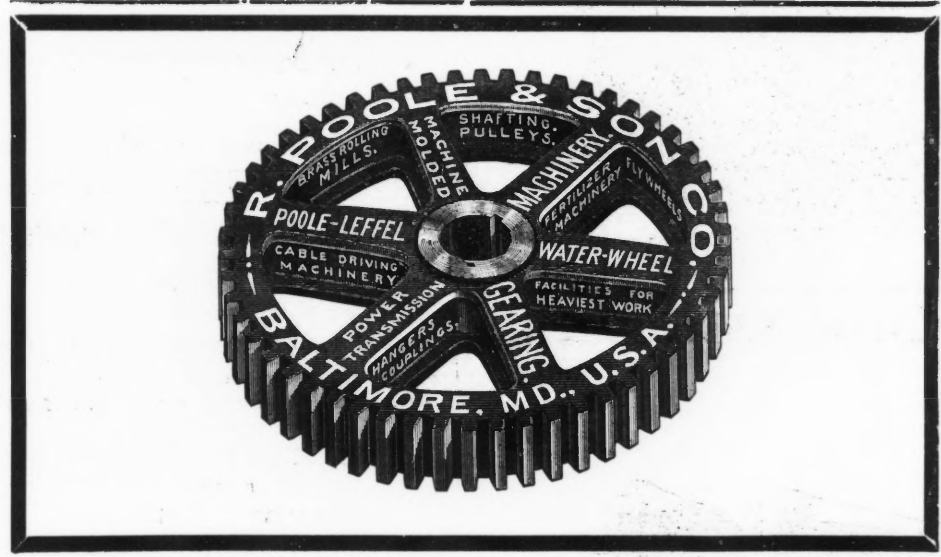


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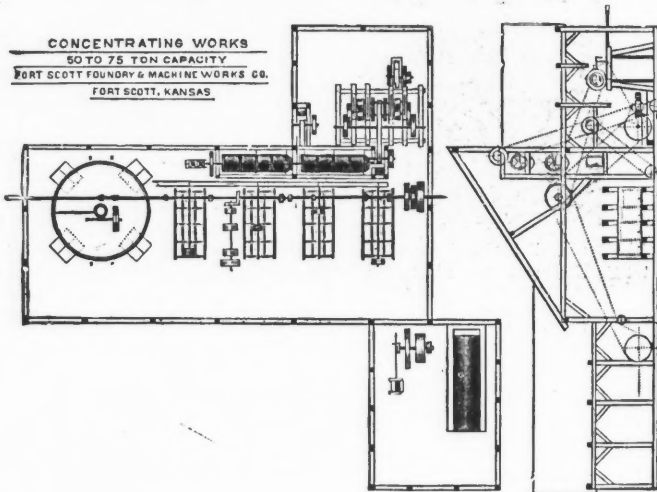
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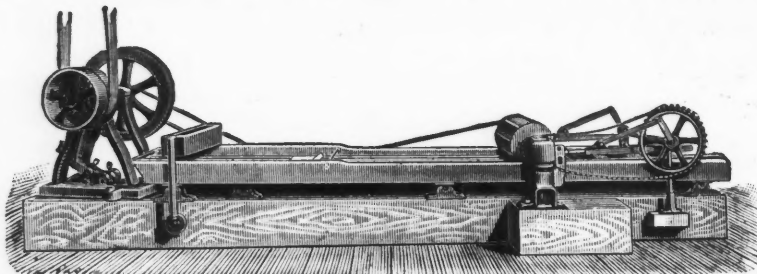
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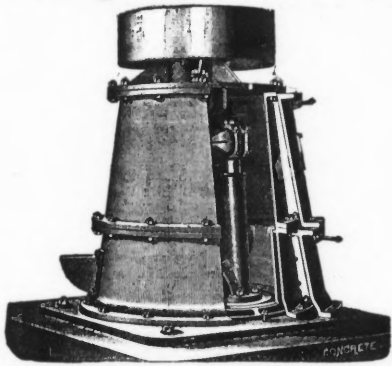
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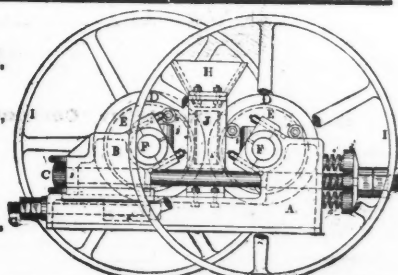
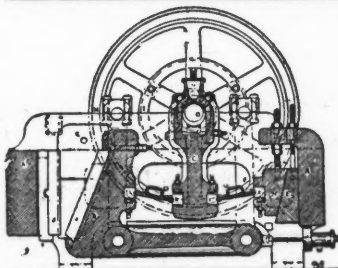
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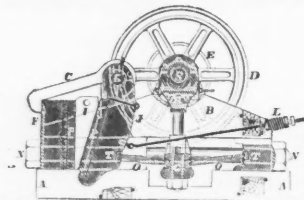
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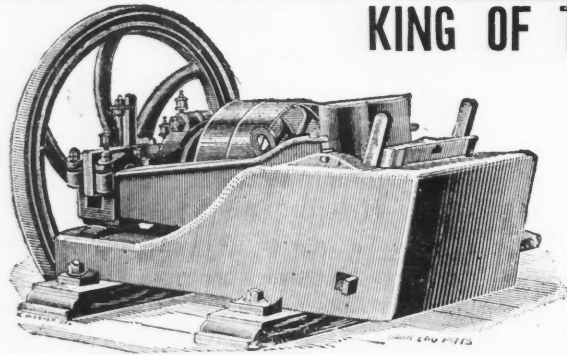
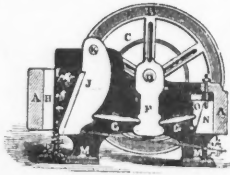
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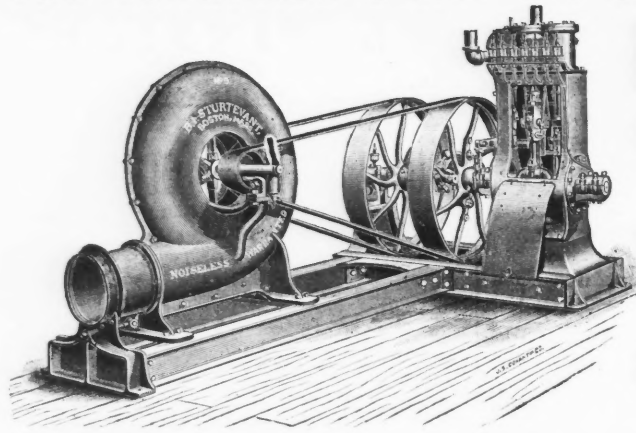
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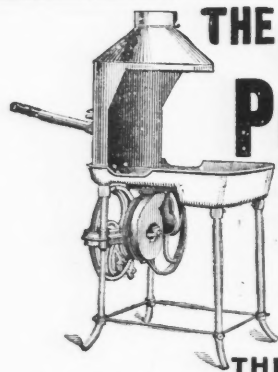
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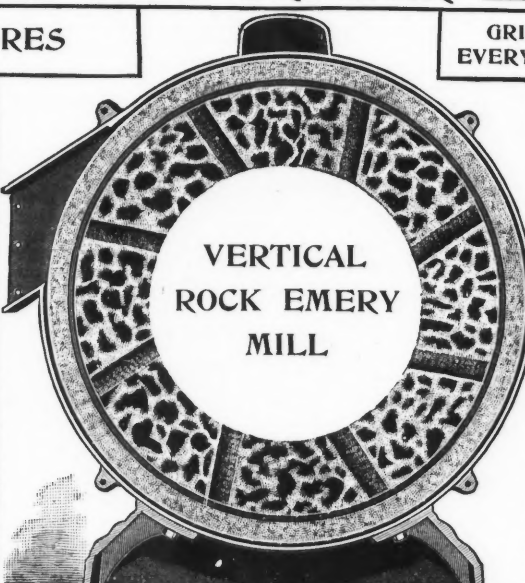
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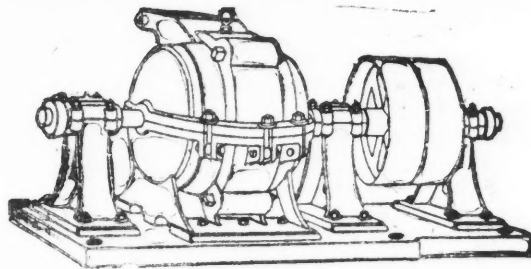
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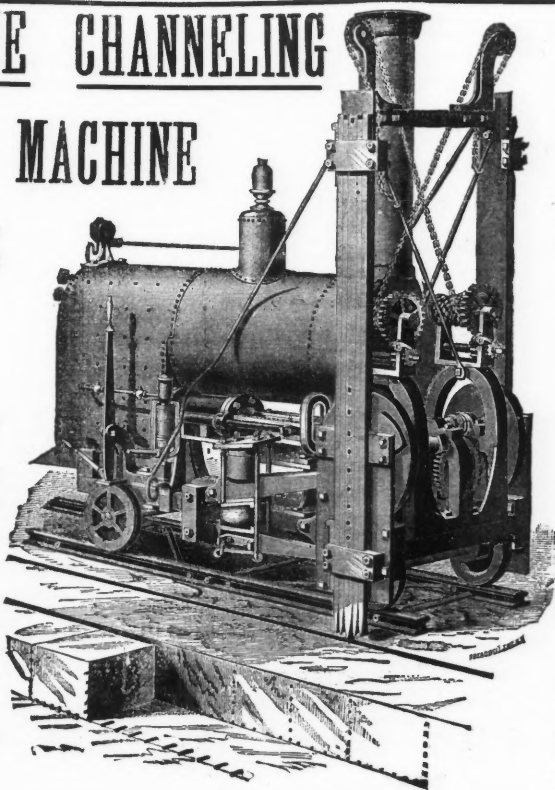
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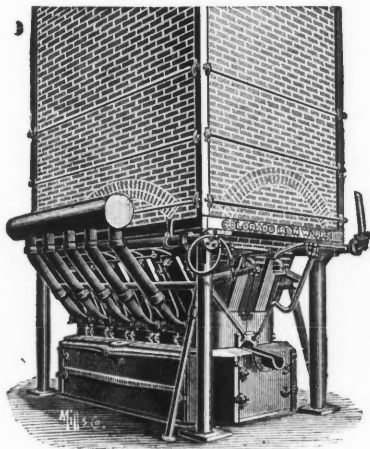
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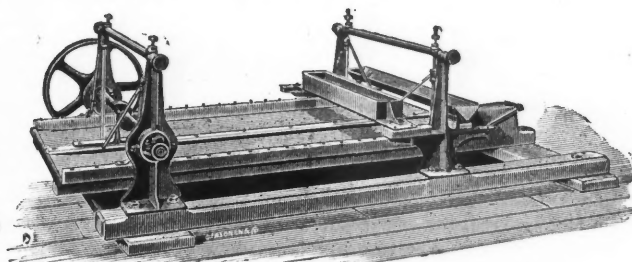
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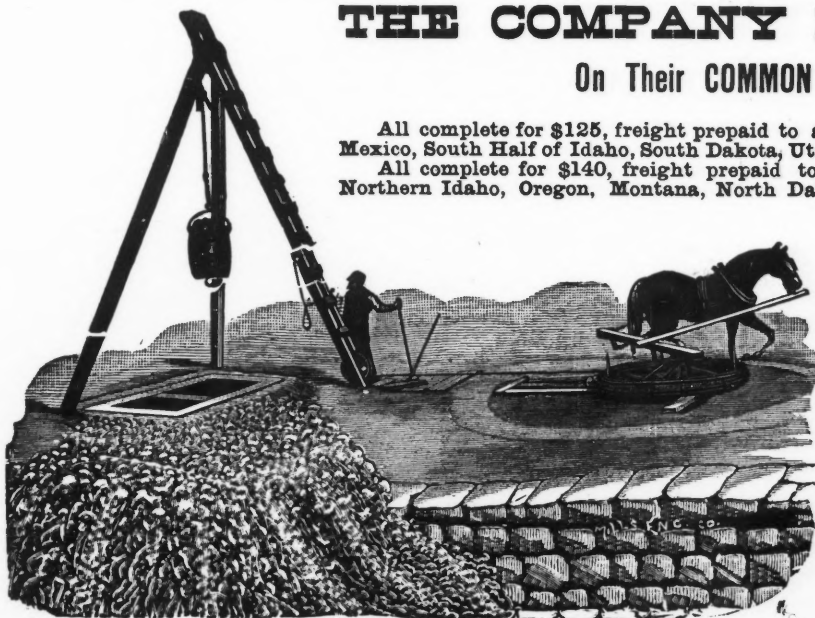
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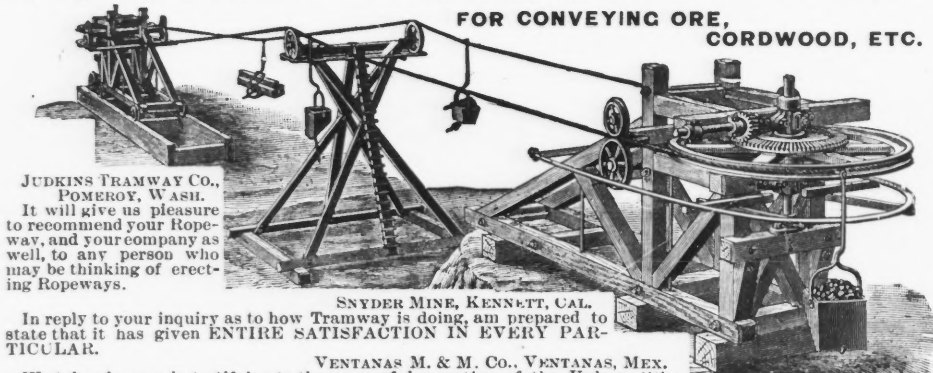
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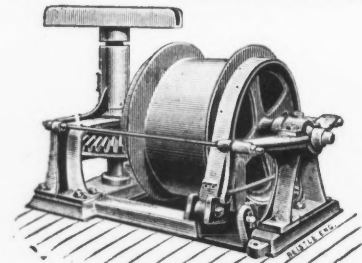
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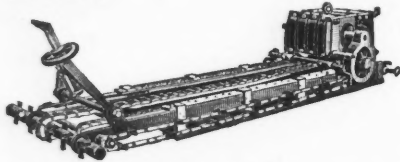
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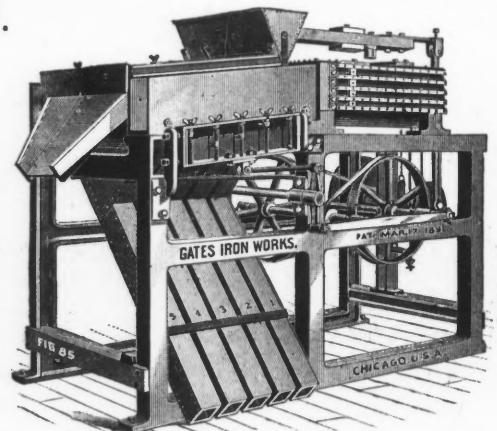
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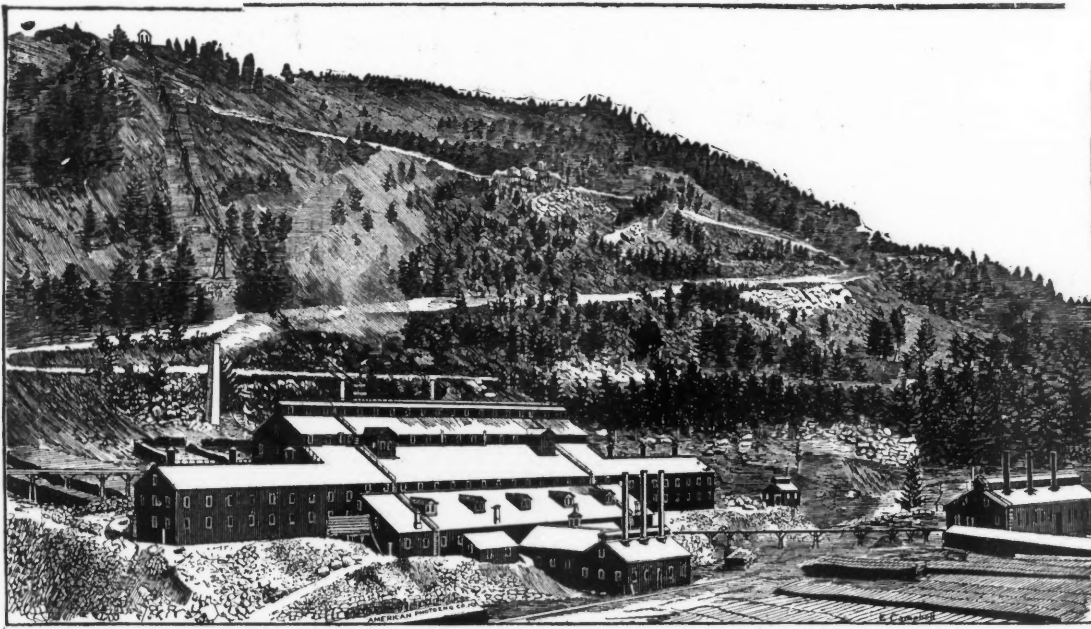
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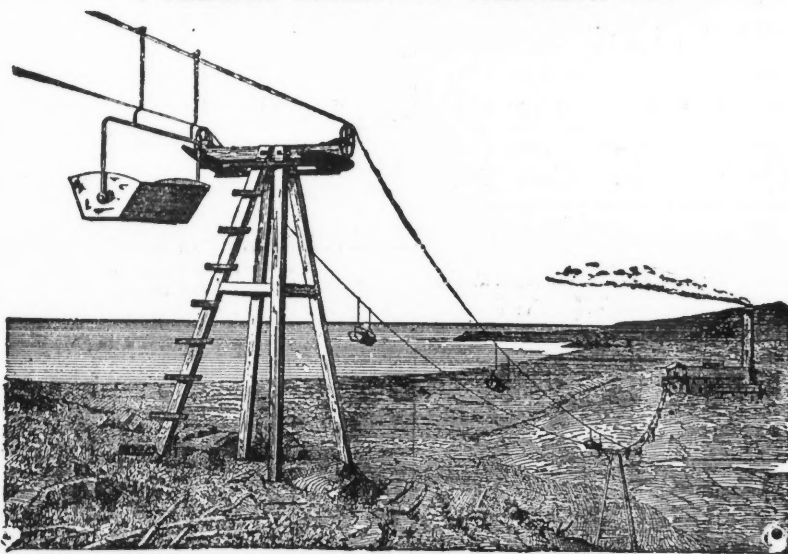
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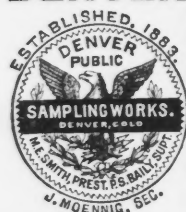
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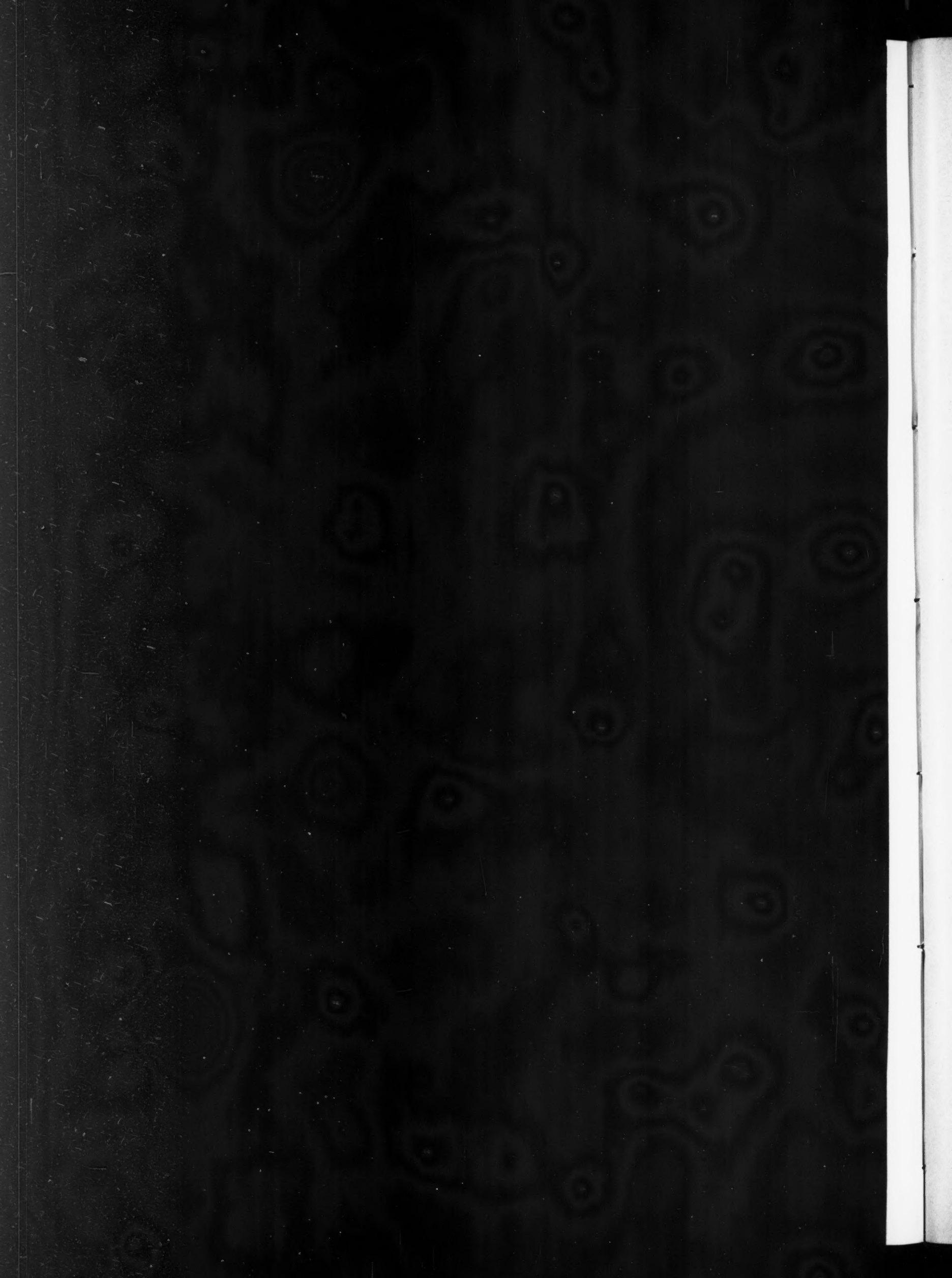
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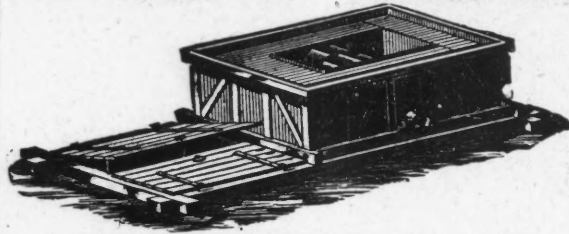
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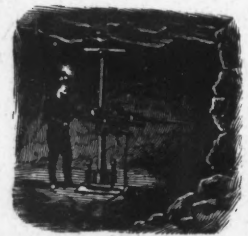
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