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CONTENTS.

Table with 2 columns: Article Title and Page Number. Includes sections like Editorial Notes, Pig Iron Production, Bessemer Steel Production, Capitalizing Investment Companies, etc.

A new iron ore field, which is said to be of considerable importance, is to be opened in Hungary. It is the eastern portion of that country on the frontier between Transylvania and the Banat.

It is stated that the coal supply for Government transports and other necessities at Manila will, for the next year, come largely from the Japanese mines. The competition was between Japan and Australia chiefly, the long ocean voyage and high ocean freights keeping American coal operators out of the market.

The representatives of the Miners' Union have failed to secure the recognition which they desired from the anthracite companies. The operators have refused to enter into conference, and say that their offer to continue the advanced rate of wages granted last fall is their final action in the case.

According to despatches from Johannesburg—which are confirmed by London advices—some mining work on the Witwatersrand is now authorized by the military government of the Transvaal. The statement is that the operation of mills containing about 350 stamps is to be permitted; the limitation, we suppose, being due to the quantity of fuel and supplies which can be transported without interfering with the military use of the railroads.

The dividends of British iron and steel companies for 1900 do not show so much increase as might be expected from the large business done during that year. With the exception of a few concerns which own their own coal mines, their profits have been limited by the high cost of fuel, and the dividends have shown very moderate increases—in some cases none at all.

The arguments in the appeal taken in the American Smelting and Refining Company case, as made before the New Jersey Court of Errors and Appeals, were practically a repetition of those presented in the first place to the Chancellor. Nothing especially new was brought forward on either side.

At the recent meeting of the Montana Mining Company, Limited, in London, the stockholders approved the decision of the directors to give up development work and to make no further attempt to discover new ore-bodies. Work at the company's mill at Marysville will be confined—as has been recently—to cyaniding the tailings.

The advance sheet of the mineral statistics of Great Britain for the year 1900 shows that the total output of coal for the year was 225,170,163 long tons, an increase of 5,084,797 tons, or 2.3 per cent. only, over

the previous year. The quantity stated was equal to 252,190,583 short tons, while the United States production, as estimated in the "Engineering and Mining Journal," January 5th last, was 274,872,779 short tons, being greater than that of Great Britain by 22,682,196 tons. Thus the advance of this country over its chief rival, which was first secured in 1899, was not only maintained but was increased last year. The British increase last year was somewhat less than had been expected in view of the heavy demand for fuel and the high prices paid for it.

The exports of coal from Great Britain last year were 46,108,011 long tons, or 20.5 per cent. of the entire output. This does not include the coal sent abroad for the use of ships in the foreign trade. Our consumption of coal was very much larger than that of Great Britain, since the proportion exported is very small.

In another column an esteemed correspondent calls attention to the fact that the published statements of exports are often somewhat misleading in that the goods sent abroad are not always credited to the country which consumes them, but to some intermediate port. Thus articles whose ultimate destination is Russia may be given in the returns as exported to Holland or Germany, and other cases might be cited. To a certain extent this is unavoidable, customs officers being necessarily guided by ships' clearances and manifests, bills of lading and similar documents. We have frequently found this difficulty in studying export statistics. It is found in the returns of other countries as well as our own. Thus the British reports show an entirely disproportionate amount of exports to Holland, which is due to the fact that railroad connections to certain parts of Germany are better from Rotterdam than from Hamburg or Bremen. To a certain extent this confusion of statistics is unavoidable; but we think, in view of the growing importance of our export trade, that more pains might be taken to ascertain the ultimate destination of shipments as well as the port of immediate consignment.

In our last issue we gave the values of the mineral output of British Columbia for 1900, as reported by the Provincial Mineralogist. We now add the quantities, from a statement just received. The metal production was as follows:

	1899.	1900.	Changes.
Placer gold.....Oz.	67,245	63,936	D. 3,309
Lode gold.....Oz.	138,315	167,153	I. 28,838
Total gold.....Oz.	205,560	231,089	I. 25,529
Silver.....Lbs.	2,939,413	3,938,705	I. 999,292
Copper.....Lbs.	7,722,591	9,977,080	I. 2,254,489
Lead.....Lbs.	21,862,436	63,158,621	I. 41,296,185

The quantity of ores mined in the Province last year was 554,796 tons. The total number of shipping mines reported in 1900 was 99, of which there were 60 which reported over 100 tons each.

The production of coal reported for last year was 1,439,595 tons, against 1,294,132 tons in 1900, showing an increase of 145,373 tons, or 11.2 per cent. The coke made was 85,149 tons, against 34,281 tons in 1899, an increase of 50,868 tons. The production of coke was more than doubled last year.

As the output of coal in British Columbia is rapidly increasing and attention is now being directed to its iron deposits, it appears as though it will not be long before the mineral production of the province will be greater, not only in the total, as at present, but as well in all the individual minerals (excepting nickel and platinum), than that of the remainder of the Dominion east of the Rocky Mountains.

PIG IRON PRODUCTION IN CANADA.

Since 1894 the American Iron and Steel Association has been collecting statistics for the Canadian blast furnaces, as well as for those of the United States, and its figures for the year 1900 have just been received. Although preparations are being made for a largely increased output of iron and steel in the Dominion, the actual quantity reported was less than in 1899 by 7,987 tons, or 8.5 per cent. The production for the year reached a total of 86,090 long tons, 15,741 tons of which were made with charcoal and 70,349 tons with coke as fuel. Only 3,781 tons were classed as Bessemer pig. The production for six years has been as follows, the changes from the previous year being given after each year, in long tons:

Year	Tons.	Changes.	Year	Tons.	Changes.
1894	44,791		1898	68,755	I. 14,969
1895	37,829	D. 6,962	1899	94,077	I. 25,322
1896	60,080	I. 22,251	1900	86,090	D. 7,987
1897	53,796	D. 6,284			

The consumption last year was somewhat less than the production, stocks of iron unsold having increased 2,533 tons.

On December 31st, 1900, there were 10 completed furnaces in Canada and 4 furnaces were in course of construction. During 1900 one new furnace was completed at Midland, Ontario, by the Canada Iron Furnace Company, Limited. It was blown in early in December, 1900. The other 4 furnaces referred to were all being erected by the Dominion

Iron and Steel Company, at Sydney, Cape Breton, Nova Scotia. One of the furnaces was completed early in 1901 and was blown in on February 5th last. Another will soon be put in blast. From this plant and from the Midland furnace a large output is expected during the current year.

BESSEMER STEEL PRODUCTION IN THE UNITED STATES.

The full and accurate statistics collected by the American Iron and Steel Association have now been so far completed for last year, that we are able to give from them the production of Bessemer steel in the United States for the year 1900. The total was 6,685,770 long tons. This was a decrease from the output of 1899 of 901,584 tons, or 11.9 per cent. Notwithstanding this falling off, the total for 1900 exceeded that of any year previous to 1899; it was greater by 75,753 tons than that of 1898. It must not be supposed that the figure given above represents a decrease of like amount in our total make of steel, since there was undoubtedly a large increase in open-hearth steel, though the figures are not yet complete. The output of Bessemer steel ingots for six years past has been as follows, in long tons:

Year.	Tons.	Year.	Tons.
1895	4,909,128	1898	6,609,017
1896	3,919,906	1899	7,586,354
1897	5,475,315	1900	6,684,770

Of the production as given above for last year 6,467 tons were steel castings, against a similar production in 1899 of 3,939 tons. There were no Clapp-Griffiths works in operation in 1900 and only one Robert-Bessemer plant was active. Seven Tropenas plants were at work in that year, and all were employed in the production of steel castings.

Of the total output last year 3,488,431 tons were made in Pennsylvania; 1,388,124 tons in Ohio; 1,115,571 tons in Illinois, and 692,344 tons in other States.

The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1900 was 2,361,921 gross tons, against a similar production in 1899 of 2,240,767 tons and 1,955,427 tons in 1898. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1900. The year of next largest production was 1899. In 1887, thirteen years ago, 2,044,819 tons were made. This figure was not reached again until 1899. The figures given do not include a very small quantity of rails made each year from purchased blooms or re-rolled steel rails, statistics for which products for 1900 are not yet available. Making the usual allowance, we find that 38.8 per cent. of the Bessemer steel ingots made in 1900 were used in the manufacture of rails. The exports of steel rails last year reached a total of 356,245 tons, or 15.1 per cent. of the total rail production.

For some years past the figures of the Association have included a classification of the rails made according to weight, from which some interesting conclusions can be drawn. This division of the rail production for two years past is as follows:

	—1899—		—1900—	
	Tons.	Per ct.	Tons.	Per ct.
Under 45 lbs. per yard.....	130,135	5.8	154,796	6.5
Between 45 and 85 lbs.....	1,531,108	68.3	1,605,067	68.0
Over 85 lbs.....	579,524	25.9	602,058	25.5
Totals	2,240,767	100.0	2,361,921	100.0

In heavier rails the changes were slight. The increase in light rails was probably due to the activity in construction work, and to the large demand for mine rails.

Of the total rail output 1,195,225 tons, or a little over one-half, were made in Pennsylvania. When the small quantity of iron rails still made, and those rolled from open-hearth steel are added, our total rail output in 1900 will be found to be about 2,400,000 tons.

CAPITALIZING INDUSTRIAL COMBINES.

The speculation in industrial stocks, which has had almost unchecked course during the past two years, has been founded largely upon the enormous issues of securities of that class which followed the organization of the numerous combinations formed in that period. These stocks were put upon the market in a time of abundant money and active speculation, when they could be marketed with little difficulty. They were readily absorbed, in part by those who bought only to sell again when they could do so at a profit, but in part also as investments from which a future return might be expected. In both cases they were taken chiefly by people who either did not care about their real value, or who took them entirely on the recommendation of brokers and other interested parties. The result is that an enormous mass of so-called "securities" is in the hands of people who know very little about them beyond the daily quotations. For the present these are generally high; but when contraction follows the present period of prosperity and boom, sharp reactions may be expected and heavy losses will be the result.

The fact is that under the conditions which have prevailed in the for-

mation of all the recent industrial combinations, the nominal capitals have been placed at figures out of all proportion to the real values of the property represented. The general rule in capitalizing these companies has been to create two classes of stock, preferred—usually carrying cumulative dividends—and common. The common stock, almost without exception, has been pure "water"; it really represents nothing and has no value except as a speculative counter. The preferred stocks, which were supposed to represent the property values, are in most cases largely in excess of them. It is easy to judge of the prospect—or rather lack of prospect—for dividends which most of these common stocks have, even in prosperous times. In such periods the earnings are barely sufficient to meet the demands of the preferred shares; while in times of depression the arrears of preferred dividends will accumulate to an amount which will practically cut off all future for the common stocks.

Even in the few cases where some degree of moderation has been exercised, the capitalization has been based on the business of an exceptionally prosperous year, and on earnings which we cannot expect to see repeated for years to come. No attempt has been made to value plants either upon the basis of their earnings, or what it would cost to replace them; and as a rule no provisions have been made for depreciation or for the cost of the constant improvements which are needed to keep a manufacturing plant efficient, and in condition to meet competition.

It may be said that most of the great combinations have been organized to avoid competition. This may be true for the moment, in many cases; but past experience shows that the condition will not last. The big combines will soon, if they do not already, meet competition from independent plants in ways which will give the latter many advantages. The new plant, able to work economically, can force reductions which the combine with its huge capitalization and the old plants which it has to carry can ill afford. No doubt we shall have plenty of this kind of work before long; to say nothing of the starting of plants to be bought out by the trusts, which is a peculiar industry—and a very profitable one sometimes—fostered by combination methods. This branch of the subject is rather an extensive one, however, and can best be treated in a separate article.

We have stated the case of combination stocks above in a very general way; but we hope soon to present some specific facts and figures which will illustrate the weakness of some combination methods, and serve to throw some light on the real values of modern industrial stocks.

NEW PUBLICATIONS.

"Mesures Electriques." By Eric Gerard. Paris, France; Gauthier-Villars. Pages, 540; illustrated. Price (in New York), \$4.20.

This is a collection of the lectures on the subject of electrical measurements, delivered by the author at the Montefiore Technical School of the University of Liege. The introduction contains a description of experimental methods and the way in which their results are recorded, with an examination of the principal measures—geometric, mechanical and photometric—adopted by electricians. Electric measures are then carefully examined, the use of the galvanometer explained, and an account given of the way in which measurements are made and standards established. The author then treats in succession of the determinations of current intensity, of quantities of electricity, of electro-motive power, of capacity, of electric force, and of coefficients of induction. After the general descriptions, special applications are discussed, such as tests of galvanometers, of telegraph wires and cables, of power transmission lines, of accumulators, of motors and transformers. These tests and testing machines are fully described and illustrated. The work has been brought up to date, so as to include the latest practice and apparatus.

"Traverse Tables; with an Introductory Chapter on Co-ordinate Surveying." By Henry Louis and George William Gaunt. London, England; Edward Arnold. Pages, 120. Price, \$1.75.

The advantages of the co-ordinate method of plotting traverses are known to every surveyor of experience. There are several traverse tables published, but some of them are not sufficiently accurate, while the prices of others are too high for the ordinary mine surveyor. Instruments now used, both in surface and underground work, are divided into single minutes, so that the tables must be calculated for this unit of service. The tables are calculated to five significant places—four places of decimals—so that their accuracy is sufficient for all actual work, and at the same time no undue amount of arithmetical work is required in using them. The tables have been carefully re-calculated and checked, and great care has been used to secure accuracy in printing. In arranging the tables a plan has been adopted which experience has shown to be convenient for active work, all the figures needed for any given angle being found at one opening of the page and in one line. The type used is clear and of sufficient size to be easily read, without too much exertion of the eyes. The opening chapter is a clear and compact explanation of the methods of co-ordinate surveying. Prof. Louis has had much experience in actual surveying, both surface and underground, and also in teaching surveying to others; the result being that he understands very clearly what the surveyor needs. We believe that this book will be found a very useful one, and that it will be fully appreciated by those for whom it is intended.

BOOKS RECEIVED.

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

"New South Wales Statistical Register for 1899." T. A. Coghlan, Government Statistician. Sydney, N. S. W.; Government Printer. Pages, 1,016.

"Steam Boiler Economy." By William Kent. New York; John Wiley & Sons, and London; Chapman & Hall, Limited. Pages, 472; illustrated. Price, \$4.

"An Elementary Test-book on Coal Mining." By Robert Peel. London; Blackie & Son, Limited, and Philadelphia; the J. B. Lippincott Company. Pages, 300; illustrated. Price, \$1.

"Fourteenth Annual Report of the Bureau of Industrial and Labor Statistics of the State of Maine." Samuel W. Matthews, Commissioner. Augusta, Me.; State Printer. Pages, 288; illustrated.

"Tasmania. Reports on the Mineral Districts of Mounts Darwin, Huxley and Jukes." W. H. Twelvetrees, Government Geologist. Hobart, Tasmania; Government Printer. Pages, 36; with map.

"Statistical Abstract of the United States. 1900." Prepared by the Bureau of Statistics, under the direction of the Secretary of the Treasury. Washington; Government Printing Office. Pages, 468.

"Twenty-third Annual Report of the Bureau of Statistics of Labor and Industries of New Jersey. 1900." William Stainsby, Chief of Bureau. Trenton, N. J.; printed for the State. Pages, 330; illustrated.

"Die Geschichte des Eisens in Technischer und Kulturgeschichtlicher Beziehung." By Dr. Ludwig Beck. Braunschweig, Germany; Friederich Vieweg & Sohn. Pages, 176; illustrated. Price (in New York), \$1.75.

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 will only be published when requested.

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

The British Columbia Copper Company's Smelter.

Sir:—Supplementing the description I gave in the "Engineering and Mining Journal" of February 16th of the British Columbia Copper Company's smelter, I will give you the record of last week's run, as I think it is a record for a blast furnace of size 42 by 150 in. The ores smelted are from the Mother Lode, besides silicious ores, high in silica; otherwise no fluxes are used:

	Tons.		Tons.
March 9th, ore smelted.....	323	March 14th, ore smelted.....	249
March 10th, ore smelted.....	327	March 15th, ore smelted.....	350
March 11th, ore smelted.....	341		
March 12th, ore smelted.....	373	Total	2,429
March 13th, ore smelted.....	366	Average per day.....	347

Besides the ore smelted, some slag is put back. The coke used varies from 10 to 12 per cent., depending on the amount of sulphur in the ore and the fineness of the charge. The first matte made varies from 45 to 53 per cent. copper, but we have made as high as 58 per cent. copper matte. To handle this amount of material, only 30 men are employed, including the foremen; thus averaging 11.5 tons per man per day. At the smelters some years ago one used to figure 1 man per ton charge smelted.

Greenwood, B. C., March 16, 1901.

Paul Johnson.

Mining Engineers' Files.

Sir: I was interested in the article you recently published on a "Mining Engineer's Scrap Book," by W. S. Gresley, as we have been through all the trials and tribulations which he mentions. As there has been gradually worked out in our office a method that thoroughly and readily handles the voluminous memorandum and catalogues that we steadily accumulate, it may be of interest to some of your readers.

Our filing unit is a letter file. It can be of any type, except the double arch file. As many are used as the bulk of the accumulated matter warrants. No indexes are used in the files, which are labeled on the outside to indicate the range of their contents and arranged so as to be stored flat on their sides. They should be piled up as nearly alphabetically as possible. Catalogues are put in bodily under their most obvious subject. Any desired information on a divergent subject is cut out and handled as a clipping. All clippings that can be folded to letter size are marked in red pencil with the name of the file they belong in and put in directly. If the clipping is smaller, it is pasted to a sheet of letter sized white paper, other clippings on the same subject being pasted to the same sheet until it is full.

These sheets are marked with the file they belong in and filed alphabetically. Field notes and other memoranda are made on the same sized sheets, used in a clip holder such as delivery men use to hold their receipt forms, but large enough to hold a letter sized sheet.

When our accumulation of active working notes outgrew all kinds of solid and loose-leaf books, we simply cut the books up and treated them as clippings, under this method. We have now in use 36 files and the system never fails to produce any memorandum wanted. It is essential that the filing be alphabetic throughout and that the material be kept arranged in that way.

Chicago, March 27th, 1901.

Frederick T. Snyder.

The Big Five Mining Company.

Sir: In your issue of March 3d, among answers to inquiries we find what appears to be not a report of the Colorado correspondent, but an editorial on the work and character of the Big Five. While we are not disposed to give any attention to matters of this kind, and are

in a position to entirely disregard them, we would, of course, prefer that such things be not said about us. But the "Engineering and Mining Journal" of New York is of such character and standing in the mining world that, in justice to ourselves, we cannot allow such comment to pass unnoticed. We have been long familiar with your journal and know that in what it does it proposes to be fair and speak without prejudice. So strongly are we impressed with this idea that we feel certain that comments of the character referred to, when made regarding any business, will hardly fail to have weight with your readers. What you have said of us we feel to be unwarranted, and knowing you as we do, we feel equally certain that you will give space to what we have here to say, put as briefly as the extent and character of our business permits.

Adverse criticism of the Big Five is not uncommon. This arises from a complete misunderstanding both of the work and character. Were it clearly understood that primarily ours is a development project—the fundamental idea being to open in the largest possible way what is known to be mineral territory, and bring into a state of production by this method what otherwise could not be touched. With this idea we entered Ward, practically an abandoned gold camp, about six years ago. In this period, against adverse conditions, we have successfully opened mines old and new, that to-day will compare in value with any similar group of mines in the State of Colorado. In this period we have driven nearly 2 miles of double-track working tunnel; have erected one of the finest power plants in the State; have completed and have in successful operation a 100-ton concentration mill.

To do this has taken time and money. In this district alone, in the development of mines, equipment, and the purchase of properties, we have employed approximately \$500,000. In doing this we have exercised the best possible judgment, and have employed every dollar intrusted to us to the best possible advantage. Of this there is abundant evidence in the works themselves. We doubt if anywhere in the State there has been a larger amount of thorough mining work done than the Big Five can show at the works in Frances, and as an evidence that the company has opened valuable mines and fitted them for successful and large production, would say that there has for more than a year been standing an offer of \$3,000,000 for this property.

We have been criticised because, notwithstanding our claims of extensive ore blocked out in these mines, we have paid no dividends, and have made but small production. You, as a practical mining man, will understand that in this we may have had clear business reasons. You will certainly understand when we repeat that primarily the Big Five's work is a development project. We have not been anxious or desirous to enter upon a period of production until this could be done to the best possible advantage. We are now prepared to prove the value of these mines by actual production, and to-day we are shipping steadily from the Ni Wot Mine direct to the smelters, and our mill is in continuous operation. It is comparatively but a few weeks since that ground was entered, and what we have shown in the Ni Wot we have shown in a lesser degree at other points along the line of our tunnel.

Your space is too valuable for us to encroach further, but we would suggest that you instruct or direct your Colorado representative to visit our properties. He will be shown every courtesy and be given every opportunity to examine the mines and every feature of our work. Let him then draw his own conclusions, and let them be what they will, we will be pleased if you will give them space in your journal.

The Big Five.
By J. P. L.

Denver, Colo., March 22, 1901.

American Trade with Russia.

Sir: Referring to the United States statistics of export, anyone familiar with the general run of our export business will observe some errors when looking over the figures issued from Washington. Take the following: Our imports from Switzerland 1899-1900, \$17,393,263; our exports to Switzerland were \$249,727. When comparing the export figures issued from Washington with the corresponding import figures issued by the Swiss Government it turns out that our exports to Switzerland are not much less than our imports from there, so there must be a grave error either on the part of our own statisticians or the part of the Swiss, which error is repeated year after year, ever since our statistics have embraced the subject of foreign trade. Further discrepancies may be found in the official report figures given for several other European countries, though in these cases the errors are not so striking.

It is true that the export statistics are built up on the statements (clearances) given by the export merchants, and these statements, being each one sworn to, are fairly reliable so far as they go. But the error comes in in connection with the printed wording of the clearance blanks. The printed heading of these blanks gives to the exporter a guide as to what data are required to be filled in under the heading of the respective columns. If the heading calls for the mark and number, the exporter knows that the marks and numbers of the cases are to be inserted in the respective column. Just so when the heading calls for the contents of the cases and for the value of the goods. Again, when the heading reads: "To be landed at," the merchant knows what he has to fill in, the name of the port where the goods are to be landed. That is precisely what the merchant does when making out his clearance, and there is where the mistake comes in. Switzerland has no seaport, so if goods are shipped for Switzerland the exporter will clear them as going to Antwerp, and when the Custom House clerks come to compile their returns that shipment will be classed in under the heading of "Exports to Belgium." The exporter has given his clearance correctly, so far as he could be expected to, to comply with the printed requirements of the clearance blank; the custom house clerk made his returns correctly so far as he could on the basis of the clearances sworn to by the exporters. Still the result is a blunder.

In justice to the officials of the Custom House, I will state that they do not go entirely by the landing place put down in the clearance.

If the "mark," as appearing in the clearance, gives any clue to the final destination, they go by that clue and class the goods for the respective country. So if the shipments be marked "A. S-Zurich," the custom house officials will class that shipment as going to Switzerland. This is the reason why Switzerland is not altogether ignored in the export column of the United States. To some extent they also go by the bill of lading. If the latter is a so-called "through bill of lading"; for instance, if it reads that the goods are to go "via Hull through to Odessa," the custom house clerk will credit that shipment, not to England, but to Russia. In consequence, at least a part of the shipments going to Russia are classed as such.

To make sure of the facts an exporter had some shipments for one and the same consignee marked in different ways. The one shipment was marked "A. B. Cologne"; the other shipment was just marked "A. B." When tracing those cases in the regular statements published by the "Journal of Commerce," he found the one lot under the heading of "Shipments to Cologne"; the other lot under "Shipments to Rotterdam." When compiling his returns, the custom house clerk naturally credited the one shipment to Germany while the other went as "exports to Holland," though both went to the city of Cologne.

Following up the general principle that is shown in the above data, it is clear that such countries as have direct steamer connection with the United States are put down as receiving much more of our goods than they really do, and appear as much larger customers of the United States than the facts warrant. Thus, Great Britain appears to take an enormous proportion of our total exports to Europe, but the figure given for the last year of \$527,000,000 would dwindle down considerably if all shipments were deducted that merely touch Great Britain and were really intended for other countries. On the same principle the figure of \$89,000,000, given as our exports to Holland, would lose by far the greater part when deducting the shipments which merely pass through that country and are really intended for Germany. Just so the figure of \$47,000,000, given for "Exports to Belgium," would be cut down when deducting the shipments for Switzerland and for the south of Germany.

Now let us apply the point above brought out to our present imbroglio with Russia about the tariff. The Government figures state our exports to European Russia as \$7,420,000 for the year 1899-1900. In reality they were much larger. Numerous shipments go to that country by way of England, Denmark or Germany that never appear in our statistics under the heading of "Exports to Russia." A large portion of the goods intended for Russia goes to Hamburg, not on a through, but on a port bill of lading, and is trans-shipped from Hamburg either by rail or by steamer—a fact that is true much more in articles of manufacture like steel and iron goods than in staples like cotton, etc. Secretary Gage has issued a statement showing that out of our total exports to European and Asiatic Russia, amounting in all to over \$10,000,000, only about \$3,000,000 were affected by the retaliatory duty recently imposed by Russia, thereby intending to show that the tariff war was of small importance. These figures are nowhere near the true figures representing American business in Russia. This large market has few seaports, and during the winter months only one, Riga, is an open port. The result is that goods are consigned to European ports of other nations and re-shipped into Russia. An exporter has at present in New York an order for steam engines bought through a London house with orders to ship to Liverpool. There is every reason to believe that these engines are to be used in Russia, as the London house is the financial end of a Russian concern; yet their orders are to ship to Liverpool; here it is more convenient to make up a cargo for shipment to Russia.

Another point is that Russian ways of doing business and Russian credits are not known to American merchants. Business is done in Russia usually on six months' time and there is a good deal of uncertainty about credits there. A Russian concern buying machinery requires the seller to furnish a guarantee made by a home bank that he will fulfil his contract. Such handicaps affect business and induce American merchants to deal through English, Belgian, German and other houses which have connections in Russia and better facilities for doing business there. Most of these goods are marked as products of America, hence they pay the Russian tariff against American goods, but some of them, such as small articles of hardware, have their origin lost entirely.

The main point which I wish to make is that the United States Government statistics of export are only accurate in the grand total; but when such total is analyzed and divided into exports to different countries the figures cannot be accepted. A nation's statistics of imports are always more reliable than those of export, for reasons that are obvious.

W. L. Saunders.

New York, March 25, 1901.

PIG IRON IMPORTS IN GREAT BRITAIN.—The imports of pig iron into Great Britain for the two months ending February 28th were 32,299 tons, against 15,677 in 1900; an increase of 16,622 tons. Of the imports this year 21,713 tons were from the United States, against 8,093 tons last year.

COAL EXPORTS OF GREAT BRITAIN.—Exports of coal, coke and briquettes from Great Britain for the two months ending February 28th were 5,978,208 tons, against 6,421,196 tons in 1900; a decrease of 442,988 tons. Shipments of coal for the use of steamers engaged in foreign trade were 1,952,692 tons, showing an increase of 141,747 tons over last year.

GOLD IN IRELAND.—The London "Engineer" says that as a result of a six months' prospecting tour for gold in the County Wicklow, Ireland, Professor W. N. Hartley has subjected 110 samples to assay, the highest assay giving 0.2 oz. fine gold per ton of 2,240 lbs. This sample was obtained from a quartz vein, about 8 in. wide, on the Croghan Kinshelagh Mountain, and in the immediate vicinity of the Government workings of 1798.

SOME APPLICATIONS OF THE WETHERILL PROCESS OF MAGNETIC SEPARATION.

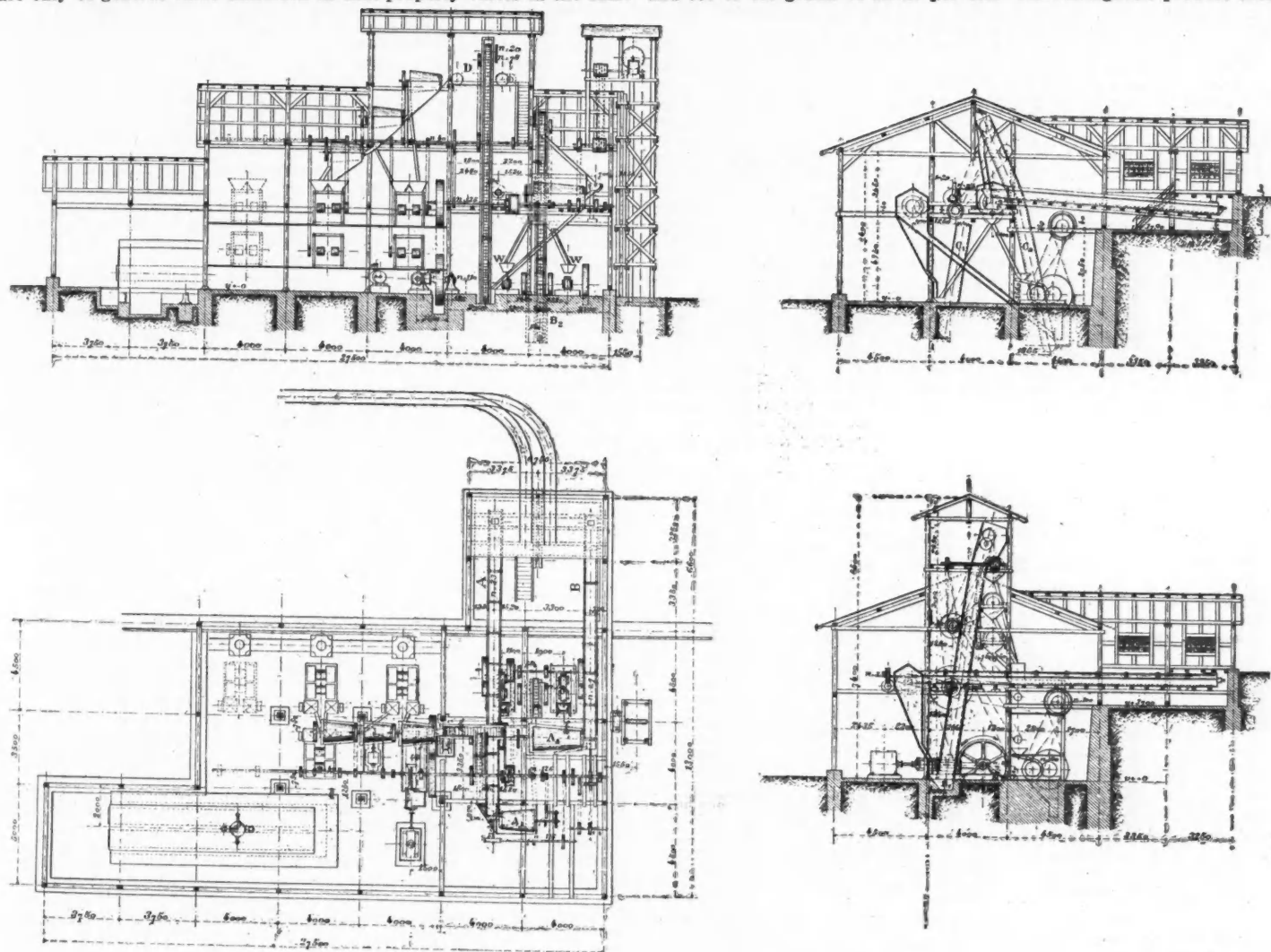
Translated for the Engineering and Mining Journal by Walter Renton Ingalls.

M. Smits, of Düsseldorf, Germany, described the Wetherill process of magnetic separation in an interesting paper read before the Congrès International des Mines et de la Métallurgie of the Exposition of 1900 at Paris and reprinted in the "Bulletin de la Société de l'Industrie Minérale," Volume XIV., 1900.

In abstracting this paper the account of the installation at the works of the New Jersey Zinc Company, in New Jersey, will be omitted, having been previously described in these columns.*

Pluecker has given the following data as to the magnetic permeability of various minerals compared with metallic iron, which is valued at 100,000: Magnetite, 40,227; siderite, 761; hematite, 714; limonite, 296; haussmannite (Mn₂O₃), 167. According to these investigations, and those of others, minerals are classed as strongly magnetic, feebly magnetic and non-magnetic. The figures given for magnetic permeability are only of general value inasmuch as that property varies in the same

The tailings of the dressing works of Broken Hill, containing a mixture of galena, blende and garnet, have now been treated with considerable success by the Wetherill process, for the application of which there have been installed two plants in Australia, one with a capacity of 30,000 to 35,000 metric tons per annum, the other with a capacity of 20,000 tons. The Broken Hill tailings assay from 25 to 30 per cent, zinc, 8 to 10 per cent, lead and 300 to 400 grams of silver per metric ton. In separating their component minerals by the Wetherill process the tailings are first dried and then separated into three or four sizes. The tailings being already of less than 2.8 mm. size for the most part, it is necessary to crush only the small percentage which is in excess of that size. The dry, sized mineral is delivered to the Wetherill separators, arranged in series. The first machine of each series separates the garnet and rhodonite, amounting to 15 to 25 per cent, of the weight of the crude mineral. The losses in blende and argentiferous galena in effecting the first separation are very small. The tailings from the first machines pass to others, which have a more powerful magnetic field and separate as the magnetic product blende assaying from 41 to 45 per cent, zinc and representing 50 to 75 per cent, of the weight of the crude mineral; this blende contains still about 8 to 10 per cent, of lead and 350 to 400 grams of silver per ton. As diamagnetic product there



WETHERILL SEPARATING PLANT AT LOHMANNSFELD, GERMANY.

mineral according to its chemical composition. Because of such a variation it is possible to separate blende from certain mixed ores. The light-colored blendes are absolutely diamagnetic; while those of dark color are generally more or less paramagnetic. Langguth, in "Fascicule de l'Electrochimie," No. 23, of December 7th, 1899, stated that the permeability of blende varies according to its tenor of FeS or MnS.

In the employment of the Wetherill process for the separation of minerals it is important to subject the ore to a pulverization sufficiently fine to free the component minerals, which must then be sized carefully by screening. It is impossible to determine in advance the proper belt-speed and magnetic intensity of the separators, which can be found only by experiment. The more intense the concentration of the lines of force in the magnets, and the greater the quantity of electric energy, the more speed at which the belt may be run, and the greater the speed of the belt the greater is the capacity of the separator. In practice, however, a limit to the capacity is soon reached, inasmuch as the intensity of the magnetic field cannot be greatly increased, since a section of the pole of the electromagnet corresponds to a determined maximum of lines of force produced in a magnetic field. The quantity of current required for a separation cannot be predicted in advance, moreover, because of the variability in the magnetic permeability of the same mineral from different deposits.

is obtained a mixture of quartz with 10 to 20 per cent, of lead, 10 to 20 per cent, of zinc and 300 to 500 grams of silver per ton, this product constituting about 20 per cent, of the weight of the original mineral; it is subjected to a further process of gravity separation in the ordinary manner, yielding a concentrated product of argentiferous galena. The total recovery of zinc varies from 80 to 90 per cent, of that which is contained in the crude tailings. The cost of the process is a little less than the cost of wet concentration in the ordinary manner as practiced at Broken Hill.

An interesting installation of the Wetherill process has been made at Lohmannsfeld, in Germany, at which place a deposit of ore consisting of galena, siderite and blende, with a gangue of quartz and quartzite is worked. The siderite (spathic iron ore) contains up to 12 per cent, of manganese. By the ordinary process of mechanical separation it was impossible to obtain from this ore any concentrate but galena of various classes, while blende and spathic iron could be got only by an expensive system of hand-sorting. The third and fourth compartments of the Harz jigs furnished always a mixed product containing from 2 to 3 per cent, of gangue and 15 to 22 per cent, of blende, according to the tenor of blende in the crude ore, the remainder being spathic iron. The quantity of this mixed product ranged from 600 to 750 metric tons per month. In order to produce a marketable blende it was necessary to roast the mixture to transform the ferrous carbonate into magnetic oxide, which could then be removed by ordinary

*"Engineering and Mining Journal," July 17th and 24th, 1897.

magnetic separators. The company operating at Lohmannsfeld not being able to install roasting furnaces at its mines was obliged to sell its mixed product under very unfavorable terms, the average price realized at the mine being from 12 to 15 marks per metric ton. Experiments in separating the ore crushed to 3 mm. size by means of the Wetherill machines gave such favorable results that it was determined to make an installation of them.

The crude mineral sent to the Wetherill plant is the middlings from the Harz jigs of the wet-dressing works, varying in size from 1 to 10 mm., and containing from 5 to 20 per cent. of water. The mineral is dried while being moved forward by means of a screw conveyor, the trough of which is made double, of cast iron, exhaust steam from the engine being passed between the two sections. The speed of the screw A is such that the mineral remains in the trough 30 minutes, while in the trough B it remains 25 minutes. These conveyors discharge the dried mineral into the primary trommels, A₁ and A₂, by which it is separated into two classes. That which is finer than 3 mm. falls into the boot of the elevator C₁ which raises it to the main system of classifying trommels; that which is larger than 3 mm. passes to two sets of rolls, whereby it is crushed, falling thence into the pit, B₂, whence the elevator, C₂, raises it to the trommel, A₂, to separate it into mineral smaller than 3 mm., which falls into the pit, B₁, and mineral larger than 3 mm. which is returned to the rolls.

All the mineral crushed to pass a 3-mm. screen is collected therefore in the pit B₁, whence the elevator, C₁, raises it to the train of sizing trommels, to reach which, however, it has to be conveyed by a horizontal belt, D, over which is set a powerful electro-magnet to pick out strongly magnetic articles such as rivet heads, small pieces of iron and steel, etc.

The sizing trommels separate the mineral into four classes, namely, 3-2 mm., 2-1.4 mm., 1.4-0.75 mm., and that which is smaller than 0.75 mm. The separated classes pass thence over three series of Wetherill separators of the two-pole and three-pole types, arranged two in a series. In the first member of each pure spathic iron is separated by a feeble current. The diamagnetic product passes to the lower machine where the intensity of the magnetic field is greater, enabling a mixed product of blende and spathic iron to be separated as the paramagnetic, while pure blende remains as the diamagnetic. The blende of Lohmannsfeld is diamagnetic even in magnetic fields of the greatest intensity, because of the absence of iron and manganese in its composition. The width of the points of the poles of the Wetherill machines used at Lohmannsfeld is 340 mm. The belt-speed of the upper machine is 40 m. per minute; of the lower 25 m. The current employed is of 65 volts electromotive force; the upper machine of the two-pole type works with 12 amperes; the lower with 14 to 16 amperes. For machines of the three-pole type the corresponding figures are 5 amperes for the upper and 8 amperes for the lower.

The plant is capable of separating 3 to 3.5 metric tons of crude mineral per hour, the crew required for its operation being as follows: One foreman, five 16 to 18-year-old boys, one machinist (enginemaster) and one stoker. The cost of treatment (year's average) is 1.4 marks per metric ton of crude mineral, no amortization of the plant being reckoned. The plant cost about 100,000 marks. Allowing 20 per cent. for amortization, = 20,000 marks per annum on 8,000 tons (the capacity of the plant) the total cost of treatment is 3.9 marks per ton. The value of the ore sent to the works being 12 to 15 marks, the total cost of production is 15.9 to 18.9 marks. The value of the blende recovered from a ton of crude mineral varies from 32 to 35 marks, so that the plant yields $16 \times 8,000$ marks = 128,000 marks per annum, not allowing for royalty on the process.

LEACHING COPPER ORES BY SULPHUROUS ACID.*

By E. P. Jennings.

The writer has had occasion in the course of his professional work to investigate a unique process of leaching copper ores by the use of sulphurous acid, which has been patented in the United States by James W. Neill, of Salt Lake City, Utah. The process, while yet in the experimental stage, has features which will make it of interest to members having deposits of copper ore remote from transportation, fuel and fluxes.

The native oxides and carbonates of copper are readily soluble in sulphurous acid with the formation of cuprous sulphite (Cu_2SO_3). This salt is insoluble in water, but soluble in water containing sulphurous acid, from which the copper can be precipitated by driving off the excess of sulphurous acid by heat. The precipitate is cuprous sulphite ($\text{Cu}_2\text{SO}_3 + 2\text{H}_2\text{O}$) and contains 49.1 per cent. of copper. This salt is a heavy, crystalline compound of a dark red color, which settles readily from the solution and can be washed by decantation, dried and reduced to metallic copper by fusing on the hearth of a reverberatory furnace. The process is suitable both for sulphide and oxidized ores, the former being first roasted to expel the sulphur and convert the copper compounds into oxides, as sulphurous acid does not attack sulphides. The ideal ore is one carrying oxides or carbonates of copper in a silicious gangue; lime and magnesia are objectionable, as they dissolve in sulphurous acid and, while they do not materially interfere with the reactions, they consume a certain amount of sulphur and so increase the cost of the process.

In practice the ore is crushed to pass a 20-mesh screen, placed in covered tanks filled with water containing sulphurous acid and kept in a state of agitation by forcing a current of sulphurous acid from the gas generators through the solution; this brings each particle of ore in contact with the acid and also keeps the water saturated with sulphurous acid gas. All the copper will pass into solution in from 1 to 4 hours, depending on the physical condition of the ore.

The charge is now drawn into a settling tank, the sands allowed to settle for a few moments, when the solution, which carries more or less slimes, is decanted into a filter press that separates the solution

from the slimes and forces it to the precipitating tank. The sands in the tank and the slimes in the filter press are washed once with sulphurous acid, which is afterward used in the treatment of the next charge. The dissolving tanks are arranged in series, one above the other; the gas entering the lower one and passing through each one in turn, any excess being at last absorbed in a condensing tower.

The precipitating tank is supplied with a steam coil through which the exhaust steam from the crushing plant is passed, thus heating the solution and precipitating the copper as cupro-cuprous sulphite, which settles rapidly to the bottom of the tank. The solution from this tank is run into another tank while still hot and freed from the small amount of copper that is in solution as sulphate by means of a little lime. The precipitates are dried and smelted to fine copper. The plant can be so arranged that nearly all the sulphurous acid except that combined with the copper can be saved and used again.

One pound of sulphur is required to convert 4 lbs. of copper into sulphite, and another pound of sulphur will keep the cuprous sulphite in solution, but the greater part of this second pound of sulphur can be recovered. In practice about 1 lb. of sulphur is required to treat 3 lbs. of copper contained in the ore. The sulphurous acid is produced either by burning pyrites or sulphur; the former can be obtained in most mining districts and the latter occurs in great beds in Utah. When the original ore is a sulphide it will furnish, by roasting, ample sulphurous acid for its own treatment.

The advantages of the process over the sulphuric or hydrochloric acid method are: 1. Cost of the chemical is low. 2. It is generated on the spot by the use of a very simple plant. 3. A relatively small amount of the chemical is used. 4. The copper is separated from the solution by heat alone. 5. The copper produced is practically free from impurities.

Sulphurous acid produced by roasting pyrites is the cheapest chemical procurable in the western country and the plant is much simpler than that used in making sulphurous acid. A unit of copper converted into cuprous sulphite requires but half the sulphur that would be required to convert it into cupric sulphate. Cuprous sulphite is precipitated from the solution without the use of scrap iron, which is a great advantage in remote districts. In Southern Utah, for instance, scrap would cost from \$40 to \$50 per ton and from $2\frac{1}{2}$ to $3\frac{1}{2}$ lbs. of iron are required to precipitate 1 lb. of copper from sulphuric acid solutions, owing to the large amount of basic salts formed. Sulphurous acid dissolves very small amounts of other metals that may be in the ore and the precipitated cupro-cuprous sulphite is practically pure and furnishes pure copper by a simple smelting operation.

In experiments made by the writer on ores of the Triassic sandstone of northern Arizona, 95 per cent. of the copper was extracted by leaching the ore for 4 hours; the ore was a mixture of blue and green carbonates with some oxide disseminated in sandstone, the grains of which were firmly cemented by a secondary deposition of silica making the rock harder to crush and much more difficult to leach than an open grained sandstone would have been, as the little particles of copper were coated with silica. A plant will be erected in the near future for the treatment of the ores of the Coconino Plateau.

RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

Specially Reported for the Engineering and Mining Journal.

WHEN SELLER IS NOT LIABLE FOR DEFECTIVE MINE.—The purchaser of a supposed onyx mine is not entitled to rescission of contract though the stone turned out to be limestone, as both parties understood that the result of a test was uncertain, and the customer knew that if the stone had been proven in advance to be onyx he could not have purchased for the price he had paid.—Hood vs. Todd (58 Southwestern Reporter, 783); Supreme Court of Kentucky.

RIGHTS OF JOINT AND ADJOINING OWNERS.—A and B were joint owners of a group of mining claims, and B was the owner of an adjoining claim. A tunnel had been run through the group owned jointly, for the purpose of working that property; and B extended the tunnel into the property owned by him, and the use of the tunnel by the latter resulted in the exclusion of A from the tunnel. The court held that A was entitled to an injunction restraining B from excluding A from the tunnel.—People vs. District Court of Lake County (62 Pacific Reporter, 206); Supreme Court of Colorado.

ABANDONMENT AND RE-LOCATION.—Where one purchased a mining claim and afterward abandoned it, because unable to do the assessment work, and his son re-located it and then sold it to his father, who claimed solely under the re-location until after another party had located an interfering lode, the son having given the date of the father's purchase of the claim in the first instance as the date of discovery, the re-location was invalid, and did not prevent a location by other parties.—Niles vs. Kennan (62 Pacific Reporter, 360); Supreme Court of Colorado.

RIGHT OF PARTIES TO HAVE MINING RIGHTS DETERMINED IN COURT.—Certain parties executed a bond and lease of a mining claim to another, who was also a part owner, under which the latter went into exclusive possession. He subsequently took proceedings to forfeit the interests of the other parties for refusing to pay their share toward assessment work, which they claimed he had undertaken by the bond and lease to do at his sole expense. After such proceedings for forfeiture he applied for a patent, obtained a receiver's final receipt in his own name. It was held that the rights of the others in the claim were not matters which could be adjudicated by the land department of the United States, but were within the jurisdiction of the court of equity, and the parties were entitled to maintain a suit for their determination without waiting until a patent had been issued to the other party.—Maltby vs. Rice (62 Pacific Reporter, 228); Court of Appeals of Colorado.

* Abstract of paper read before Canadian Mining Institute, March, 1901.

ABSTRACTS OF OFFICIAL REPORTS.

Consolidation Coal Company, Maryland.

This company owns a large coal estate in the Cumberland Region, and also owns and operates the Cumberland & Pennsylvania Railroad, which carries nearly all the coal mined in that region. The report is for the year ending December 31st, 1900. The total earnings for the year from all sources were \$2,279,969; expenses, \$1,659,743; net earnings, \$620,226, to which is to be added rentals amounting to \$98,116, making a total of \$718,342. Interest on bonds amounted to \$229,666 and dividends to \$205,000, leaving a surplus of \$283,676.

The total output of the Cumberland Region in 1900 was 3,368,464 tons. The coal tonnage handled on the Cumberland & Pennsylvania Railroad was 2,294,907 tons, a decrease of 803,029 tons. This falling off was due to the long strike of the miners, to which full references have already been made in our columns. The coal was distributed as follows: To local points, 88,124; to Chesapeake & Ohio Canal, 111,134; to Pennsylvania Railroad, 1,866,615 tons; to Baltimore & Ohio Railroad, 1,969,034; total, 2,294,907 tons.

Many improvements have been made, and the capacity of the mines now exceeds 6,000 tons daily. At the Hoffman Mine compressed air locomotives were introduced so successfully that the system is to be extended to other mines of the company. At Ocean No. 1 a 24 by 26½ by 30-in. straight-line air compressor, delivering air at 80 lbs. per square inch, has been installed to assist the present duplex machine and to avoid the possibility of the stoppage of the pumps from any accident to the present compressing plant. When the drought of the past summer threatened a shortage to the supply of water to the boilers, an additional well was sunk for the purpose of securing an ample supply. Mining machines are being used at this mine with satisfactory results.

At Ocean No. 7 a 14 by 24-in. double cylinder tail rope haulage engine has been installed, and now moves the cars in the light-grade slope of the south side and hauls the empty cars from the dump. To furnish additional steam for this plant, three 54 by 16-in. return tubular boilers were also installed. The capacity of this mine, which was opened in 1897, is now over 3,000 tons daily. This is the largest capacity of any one mine in the history of the region.

At the pumping shaft a compound high pressure air-compressor has been installed and is supplying air to the mine locomotive operating in Hoffman Colliery as mentioned. The dimensions of this machine are 28 by 30 in., and it has a capacity for delivering air at 900 lbs. per square inch. In addition to these improvements, all minor repairs have been maintained and a number of small improvements made throughout the property. With these additions, renewals and betterments to the mining plant, the total output for the year would have exceeded that of any previous year had it not been for the four months' suspension of work resulting from the strike. Total output for the year, 1,166,810 tons, a decrease of 369,658 tons, as compared with the preceding year. This output was divided as follows: Ocean No. 7, 408,669; Ocean No. 1, 351,250; Hoffman, 271,424; Eckhart, 104,454; Frost, 17,796; Ocean No. 2, 7,536; Pumping Shaft, 5,681 tons.

Horn Silver Mining Company, Utah.

This company's report for the year ending December 31st, 1900, shows receipts as follows: Sales of concentrates, \$76,559; sales of copper ore, \$68,045; sales of first-class ore, \$27,747; store at Frisco, rents, etc., \$12,247; total receipts for the year, \$184,598; balance from previous year, \$169,318; total, \$353,916. The cost of mining was \$133,842; milling, \$37,560; general expenses and taxes, \$35,351; total, \$206,753, leaving a balance of \$147,163. From this a dividend of 5c. a share was paid, amounting to \$20,000 and leaving a balance of \$127,163, of which \$114,975 is represented by cash and \$12,188 by supplies at mine.

The mining report shows 2,659 tons shipping ore and 24,752 tons milling ore extracted. There were 35,184 pit cars of ore and 10,350 tons water hoisted. There were 2,725 poles and 451,953 ft. timber used. Fuel used included 1,852 tons coal and 3,026 cords wood. The ore shipped and its value were as follows:

	Gross Tons.	Net Tons.	Per Ton.	Amount.
First-class crude ore.....	1,124	1,104	\$25.12	\$27,747
First-class copper ore.....	1,534	1,507	45.16	68,045
Concentrates	3,896	3,680	20.80	76,559
Totals	6,544	6,291		\$172,351

The contents of this ore were 280.5 oz. gold, 143,007 oz. silver, 669,648 lbs. copper and 3,716,510 lbs. lead. The costs of mining and concentration—per ton of crude ore—are reported as below:

	Per ton.	Total.
Mining:		
Labor on ore.....	\$2.087	\$57,223
Labor on dead work.....	0.703	19,257
Labor on surface.....	0.850	23,329
Supplies, timber, fuel, etc.....	1.240	34,033
Total mining.....	\$4.880	\$133,842
Concentration:		
Labor	\$0.975	\$24,127
Supplies, fuel, etc.....	0.543	13,433
Total concentration.....	\$1.270	\$37,560

The ratio of concentration was 6.3 tons of crude ore into 1 ton of concentrates. The mine report shows 942 ft. of prospecting work done, with fair results. Manager P. T. Farnsworth's report says: "The large quantities of zinc ores developed in the mine occur between the 5th and 9th levels. As near as the quantity of this ore can be measured it makes over 300,000 tons, which will average about 35 per cent. zinc, 8 per cent. lead, \$7 silver, and about 75c. in gold per ton. We have been in communication with the various zinc plants of this country with a view of finding a market for our zinc ore, but all proposals so far received were rejected. Several patentees of new treatments of zinc ores made offers of erection of plants for their various methods, but none of these were found satisfactory. The American Smelting and Refining Company proposes to erect a smelter near Salt Lake City for the treatment of zinc ores. I was informed that this company will

commence the erection of these works about August this year. I am certain that we will be enabled to sell our zinc ore for a price that will satisfy everyone concerned in the near future.

"Around the old stopes in numerable places are lead, silver and copper ores in stringers and bunches. These we will mine as long as such is found profitable, for here and there such stringers and bunches lead to quite valuable deposits. From the surface to the bottom of the 7th level the bonanza stope of the mine is caved in. When the caving occurred the walls of the stopes were ores—some high grade, much fair grade and the balance low grade stuff. Altogether this caved filling of the stope is good mill dirt, which may be concentrated to a profitable product, which can be mined and brought to the surface cheaply. The prospects for next year are much the same as they were during the year 1900. The net profits from the mercantile business was \$12,811, \$12,000 of which will be turned over to the treasurer, the balance, \$811, will be used in reducing values of real estate, etc.

Atlantic Mining Company, Michigan.

The report of this company is for the year ending December 31st, 1900. The statement of assets at the close of the year shows assets as follows: Cash, \$11,627; copper bills and copper on hand, \$109,340; supplies at mine, \$102,642; merchandise in mine store, \$72,447; accounts receivable, \$5,078; total, \$301,134. Bills and accounts payable amounted to \$45,172, leaving a balance of assets of \$255,962.

The development work for the year included 348 ft. shaft sinking (average cost \$25.02 per foot); 29 ft. forks (\$12.50 per foot); 30 ft. winzes (\$7.59 per foot); 5,823 ft. drifting (\$5.25 per foot); 20,591 fathoms stoping (\$4.02 per fathom). The total ground broken was 23,072 fathoms. The rock stamped was 410,674 tons, from which there was obtained 6,577,955 lbs. mineral, yielding 4,930,149 lbs. refined copper. This was 213 lbs. copper per fathom of ground broken; 12 lbs. per ton of rock treated, or 0.6 per cent. The receipts and expenses, with the averages per ton of rock treated and per pound of copper, were as follows:

	Total.	Per ton rock.	Per lb. copper.
Total receipts.....	\$809,177	\$1.9700	\$0.1641
Mining and surface expenses.....	\$425,398	\$1.0258	\$0.0853
Transportation to mill.....	28,428	0.0692	0.0058
Stamping and separating.....	101,429	0.2470	0.0206
Smelting and marketing.....	60,301	0.1470	0.0122
Total working expenses.....	\$615,556	\$1.4990	\$0.1249
New construction.....	114,007	0.2775	0.0231
Total	\$729,563	\$1.7765	\$0.1480
Net earnings.....	\$79,614	\$0.1935	\$0.0161

The net earnings, added to \$176,348, brought forward from previous year, made a total of \$255,962, as shown above. Since the close of the year a dividend of \$2 per share, or \$80,000 in all, has been paid from this surplus.

The directors' report says: "The yield of the rock has been disappointing, having been only 12.04 lbs. copper per ton of rock stamped, but as there has not been any interruption of work, the production of copper was somewhat larger than in 1899. It will be seen that the amount expended in construction has again been large, but the work could neither be avoided nor postponed. The crib dam which was built in 1894 across the stream that supplies the stamp mill with water, showing signs of weakness owing to the disintegration of its sandstone filling, it was determined to construct a new dam of a more permanent character, and, as the Baltic Mining Company was preparing to erect a stamp mill on adjoining lands, arrangements were made to build a new dam of sufficient height to provide a large reservoir of water, which could be drawn upon in the seasons of drought, each company paying one-half of the cost, and to have a joint use of the water privilege. Stone of a proper quality for such a structure does not exist in the vicinity, and can only be procured at a high cost for transportation, and, as the erection of a stone dam of the size required would occupy more time than could be spared, it was determined to construct a dam of steel, with a concrete base. This work is under the direction of competent engineers, and we are assured of its security and permanence. The dam was not completed when frost stopped the work for the season, but we have no doubt that it will be finished next summer by the time that it may be needed. Its estimated cost is about \$130,000, but, as it will supply both mills with water by gravity, the advantage over a pumping plant to draw the needed water from an intake out in the Lake is apparent.

"It was also found necessary to provide a new hoisting plant for our deepest shaft (D shaft). It was not intended that this work should be taken up so soon, but a structural weakness having developed in the winding drum, which carries 3,100 ft. of rope on each end, it became necessary to take action at once, and a more powerful plant with capacity to hoist from a depth of 5,000 ft. is now nearly ready to go into commission. The erection of this plant will practically complete the work of equipping the mine for deep hoisting, which has been forced upon us more abruptly than was anticipated, on account of the destruction of C shaft by fire in November, 1898, and the consequent necessity of increasing the duty of the other shafts."

MINERAL IMPORTS AND EXPORTS OF SPAIN.—Imports of fuel into Spain in January included 165,485 tons coal and 12,915 tons coke. Imports of metals included 2,473 tons pig iron, 323 tons wrought iron, 1,587 tons steel and 70 tons tin-plates. Exports of minerals for the month are reported by the "Revista Minera" as below, in metric tons:

	1900.	1901.	Changes.
Iron ore.....	685,069	626,445	D. 58,616
Copper ore.....	80,935	54,278	D. 26,657
Zinc ore.....	6,730	6,448	D. 282
Lead ore.....	126	156	I. 30
Salt	13,116	21,314	I. 8,198

Exports of metals were 140 tons pig iron (6,608 tons, 1900); 1,140 tons copper (2,031 tons, 1900); 11,976 tons lead, against 13,703 tons.

ELECTRICALLY OPERATED MINES IN EUROPE.

Written for the Engineering and Mining Journal by Frank C. Perkins.

Many European mines are being worked with great satisfaction by electrically operated machinery of different types. One of the first requisites in a large mine is that it be kept free from water which greatly obstructs the proper working of a mine. The electrical mining pump fills this want satisfactorily and operates with economy and safety.

The next essential element of a complete mining plant is that of ventilation. The main ventilators and many auxiliary ventilators are now operated extensively by electric motors.

The transferring and raising of materials require mining locomotives and hoists which are found to be most economically driven by electric power. Some instances of electric mining plants are given below.

Ferdinandsgrube Electrical Pumping Plant.—The Siemens & Halske Company installed an electrically operated pump in the mine of Katt-

nected to the motor with flange couplings. It has a capacity such that a duplicate pump can be attached on the opposite end of the motor shaft when desired.

While polyphase currents are being largely used in mines, it is often necessary to have direct current at hand for operating electric locomotives and some other types of mining machinery which are best worked with continuous current. It is then found necessary to arrange substations with rotary converters and supply what direct current may be needed in this way without operating special direct current generators. This is largely done both in American and European mining plants.

The ventilation of the mine at Ferdinandsgrube is maintained by two classes of ventilators. First, a main ventilator plant which supplies air through the main shaft to the various parts of the mine; and, second, by auxiliary ventilators which are portable and are used for driving out the gases and supplying fresh air to certain sections of the mine not getting service from the main ventilator. The diagram shown in Fig. 3 gives a good idea of the main ventilator which is direct connected and operated by a Drehstrom motor of 120 H. P. capacity. This motor is

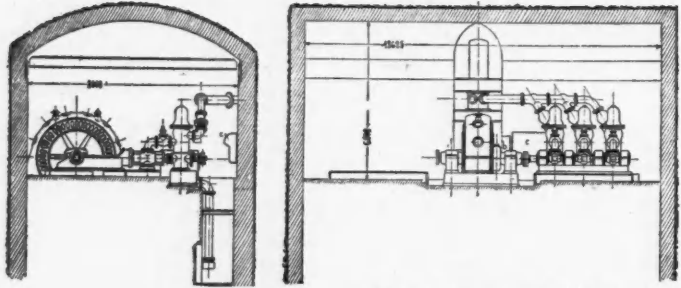


FIG. 2.—DREHSTROM MOTOR AND TRIPLE-ACTING PUMP AT FERDINANDSGRUBE.

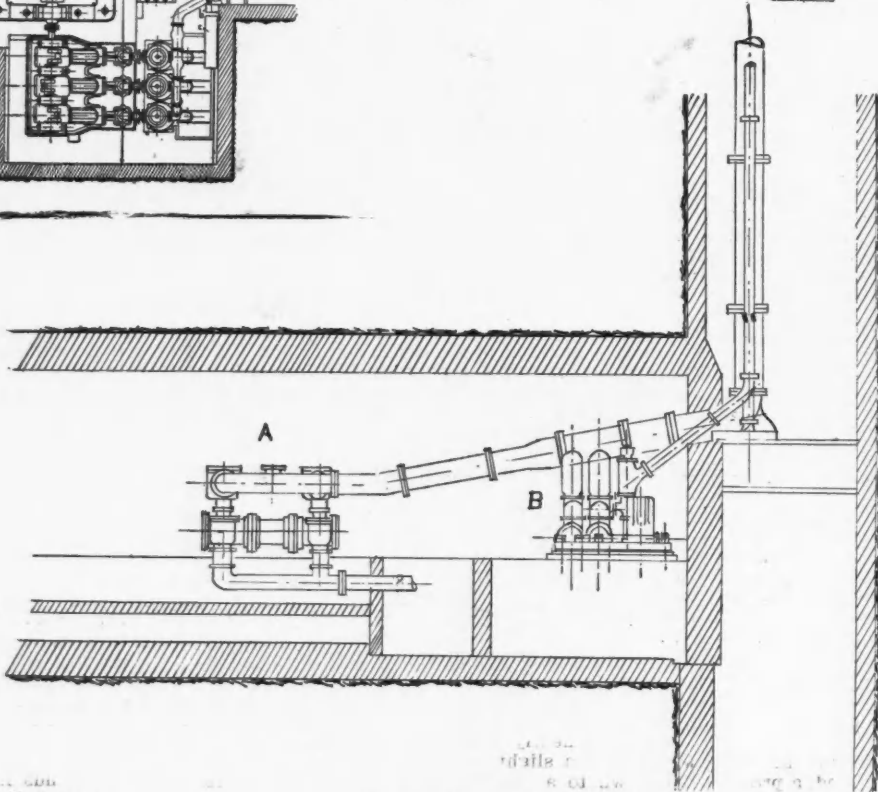
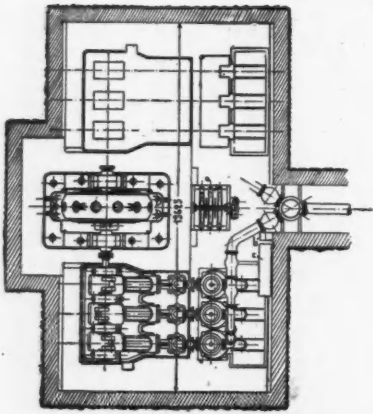


FIG. 1.—SIEMENS-HALSKE PUMPING PLANT, FERDINANDSGRUBE.

swetzer Aktien Gesellschaft Ferdinandsgrube, as shown in the diagram, Fig. 1. The apparatus marked A is a steam pump which has been in operation for a considerable length of time and was replaced by the electric pump as shown at B. This pump was constructed by the Carlshutte Aktien Gesellschaft of Altwasser and is of the type known as the Riedler express pump. It has a speed of 184 revolutions per minute, raising 1.5 cubic meters of water per minute to a height of 200 m. A polyphase electric motor of 500 volts is directly connected to this double pump. Another triple electric pump operates under a head of 300 meters, raising water to this height at the rate of 5.5 cubic meters per minute, Fig. 2. This electric motor has a capacity of 450 H. P. and operates at a speed of 146 revolutions per minute. The pump was constructed by the Maschinenbau Anstalt of Breslau, and is one of the triple type con-

supplied with a polyphase current at 500 volts potential from the generating station near at hand. This generating station not only supplies current for operating the ventilator, but also the necessary energy for the electrical mining pumps, the electric hoisting apparatus and other electric mining machinery.

Electric Mine Ventilators at Karwin.—An electrical auxiliary ventilator is in operation at the Kaliwerken Aschersleben. This is a portable affair and can be placed in any section of the mine desired. The main ventilator is located above ground and is of very large capacity. An example of such an electrical ventilator is seen in Fig. 4. This apparatus is located at the mine of Gabrielenzechen at Karwin, in Austrian Silesia. The motor operating this main ventilator has a capacity of 200 H. P., and is supplied from a 200-volt Drehstrom generator.

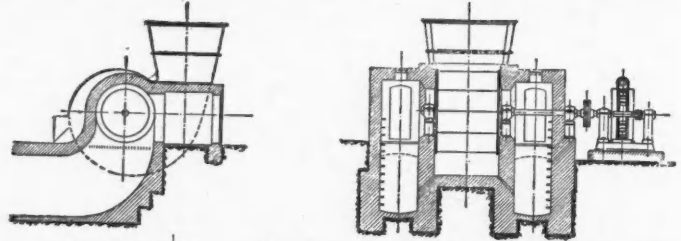
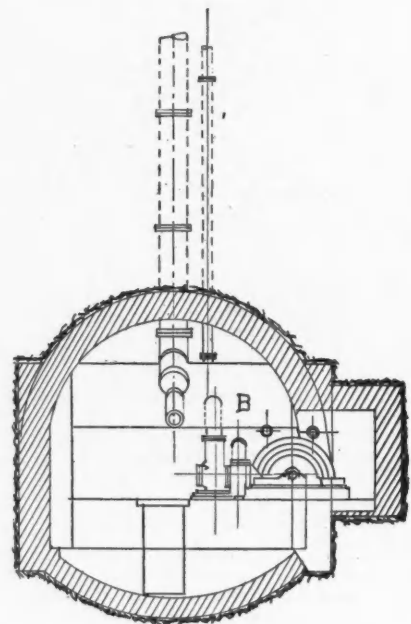
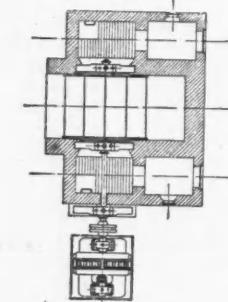


FIG. 3.—ELECTRICALLY OPERATED VENTILATOR AT FERDINANDSGRUBE.



THE UTILIZATION OF BLAST FURNACE GAS IN EUROPE.*

By A. D. Elbers.

European blast furnace practice differs, as a rule, from American practice on account of the following conditions: The average profit on iron making is not so great as to allow the speedy introduction of modern improvements that necessitate the radical change of a plant or the abandonment of costly machinery that may still be serviceable for a long time if the old system is adhered to. The adoption of such improvements is, in that respect, merely a question of capital account. With large profits assured, the cost of the plant may be increased correspondingly, but with uncertain prospects the cost has to be kept down if conservative business methods are to prevail.

The Europeans smelt poorer ores, in some cases so lean that up to 2¼ tons of slag have to be made with each ton of pig iron. This requires a greater amount of fuel; and even with this greater amount of fuel the output of metal is comparatively small, because the stack is choked up, as it were, by the great bulk of the scorifying material that has to pass through it.

The iron ore is, as a rule, softer, and the coke less compact than in this country. Hence, the stacks cannot be made so high as might be desirable for minimizing the escape of heat through the furnace mouth, or, in other words, for retaining as much as possible of the heat of the escaping gases. This deficiency may, to some extent, be made up by increasing the temperature of the hot blast; but that, again, involves considerable expense when no provision for such eventual changes has been made in the plans of the original installation.

the Cowper type, of 7 m. diameter and 30 m. high. The coking coal is mined in the vicinity of the works, and after being washed is transported by cable tramway to the coking ovens, which stand very near to the blast furnaces. The ovens are arranged in double rows, and in such manner that the coke drawn from each set of rows can be discharged into a central, depressed channel, from whence it is conveyed by rope to the elevators or hoists, one for each pair of stacks. The by-products of the ovens are tar, ammonium-sulphate and benzol. The blast furnaces have a height of 25 m. a diameter of 6 m. at the boshes, and hearths of 3.3 m. diameter. The daily production of each furnace amounts to from 250 to 300 tons of Thomas (basic) iron.

THE COALINGA OIL FIELD, CALIFORNIA.

Written for the Engineering and Mining Journal by W. G. Young.

Among the different petroleum districts of California that of Coalinga, situate in Fresno County, a trifle south from the center of the State, is of interest. The sensational discoveries made in this field gave an impetus to the work of prospecting, which led to the development of one or two districts that have since become famous as oil producers. It was in the fall of 1893 that oil was first discovered at this place. Two pioneers, Rolland and Lacey, being impressed with the surface indications thereabouts, began the work of drilling the first well with a primitive rig, and after several months succeeded in striking oil, though not in very large quantities. The work was sufficient, however, to give an impetus to prospecting work which resulted

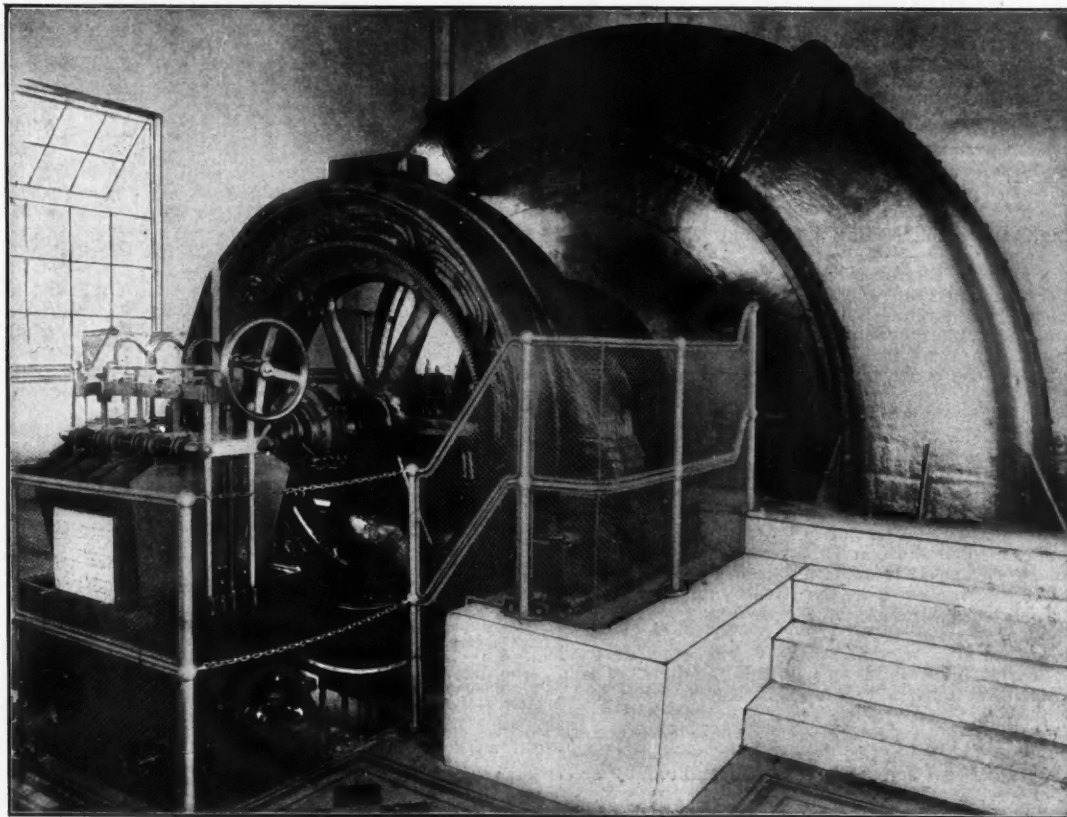


FIG. 4.—VENTILATING FAN AND MOTOR AT KARWIN, AUSTRIAN SILESIA.

It seems, therefore, likely that at many European blast furnaces it will be unavoidable—now as well as in the future—to make more gas than can be used in the hot stoves, and for the motive power that is required around the furnace, and that the modern gas engine will find its most ready introduction wherever a surplus of gas can be used to advantage for supplying power to other establishments in the vicinity of the iron works. But it is not likely that the gas engine will supersede the gas-fed boiler entirely—no more so than electric light has supplanted gas light. Each has its sphere of usefulness and probably always will have.

It is a rather curious coincidence that just about the time when the plans for using blast furnace gas in the engine were perfected, a prominent German blast furnace engineer (F. Braune, in Neunkirchen on the Saar) should have come out with the scheme of using all of the furnace gas for the hot-blast stoves, by adding an additional stove to the usual group of four, and of generating the steam for the boilers entirely with coal. This proposition, which implies that the gas is more valuable for heating the stoves than for supplying the power for the blast, is fully detailed by Mr. Braune in an article that appeared in the "Zeitschrift des Vereines Deutscher Ingenieure," of September 10th, 1898, which article may be considered one of the most scientific contributions to the modern literature on blast furnace practice.

It may also be of interest to note here that the new blast furnaces at Bruckhausen, on the Rhine, of which the same journal gives a short account in its issue of September 2d, 1899, have, each, 5 hot stoves of

in the opening of an extensive and productive area. This latter work was begun in the spring of 1895, when a couple of wells were drilled, both of which exceeded in their outputs the first one in the field. From that time on there has been a steady increase in the development of oil property in the locality, until to-day the district is one of the best known of the State.

One of the early wells was the phenomenal gusher, popularly known as the Blue Goose. A large amount of gas accompanied the petroleum when this well was first opened, causing it to spout for some time at the rate of nearly 1,000 bbls. per day. This continued regularly for weeks with a slight but steady diminution. The well eventually settled down to a steady producer of about 200 bbls. The oil sands in this section are very gaseous, and when the oil sand is penetrated, the gas pressure being released usually throws the petroleum to a great height. In many instances the pressure continues, but on the average the gushing periods are intermittent and the wells eventually cease spouting altogether.

Like most of the oil districts of California, the productive area extends from the northwest to the southeast. There are at Coalinga several well-defined oil bearing strata, one overlying the other at more or less regular intervals. The dip is often precipitous and the extent of the sand varies, making the outcome of a drilling venture uncertain. Productive wells are found at widely different depths, some being not more than 500 ft. deep and running from that to a maximum depth of 2,000 ft. The best producers are found at the lower levels. While there have been several wells giving an exceptionally large flow of petroleum, the average output will not equal the wells of the Kern

*Abstract of paper in "American Manufacturer," Pittsburg.

River field. The oil found here, however, is of a much higher specific gravity, running from 22° up to about 35°.

In marketing their oil, Coalinga producers have an advantage over many of the other fields of the State. A 3-in. pipe line extending from the center of the district to a station on the railroad 9 miles distant, furnishes adequate means for getting the product to market. A toll of 10c. per barrel is charged for delivery.

During the early operations considerable difficulty was encountered in securing a sufficient water supply. Several of the principal companies then operating joined forces and sunk a couple of water wells, securing an abundant flow, which was piped 5 miles to the fields under a pressure of over 700 lbs. to an altitude upward of 1,000 ft. The cost of the water plant was about \$25,000. The storage facilities in the field are quite extensive. The fact that a ready market is found for the oil and a continuous pipe line service is at hand, reduces the storage problem to a comparatively simple matter.

Oil City, which takes its name from the well-known oil center of Pennsylvania, is little more than a collection of shanties, cabins and blacksmith shops, so that the place is a city in name only. It is the center of much activity, however, and will doubtless continue to grow as operators extend the field in other directions. New work is constantly being prosecuted and more territory annexed to the already proven field. There yet remain many hundreds of acres of untried territory on which the indications are as favorable for oil as at any point where the best producers are now being operated. The territory is an expensive one to exploit, and when to this is added the uncertainty attendant upon such operations, the amount of new work being done is large. Although there have been numerous failures in this field, some of them quite expensive, the general results obtained have been highly satisfactory.

Tributary to Coalinga are several important districts where petroleum has been found in paying quantities, and where prospecting work is now being carried on. Though less widely known than the Coalinga field, some of these have already developed a considerable production and are reckoned by all oil men among future possibilities.

DEVELOPMENTS IN THE WASHINGTON COUNTY COAL-FIELDS, PA.

Written for the Engineering and Mining Journal by W. G. Irwin.

Some 10 or 12 years ago the Ellsworth Coal Company, which for a long time previous to that had been operating coal mines in Illinois and which is an adjunct of the Illinois Steel Company, opened a model mine at Ellsworth on the Youghioheny near Suterville, Pa. This marked the beginning of the operations of this firm in the Pittsburg coal-field. Since that time the concern has acquired large coal areas in this field.

During the past 2 or 3 years the attention of this company has been centered in the Washington County coal-fields in Pennsylvania, where large coal areas have been bought up and a number of mines have been opened. The Ellsworth Coal Company now owns 16,000 acres of coal lands on Pigeon Creek near Bentleyville, Pa. Two shaft mines have been opened there and the new town of Ellsworth, a model coal town, has been founded by the company. The mines located there are known as Ellsworth Nos. 1 and 2. The shaft at Ellsworth No. 1 reached the coal bed at a depth of 269 ft. and at No. 2 at a depth of 287 ft. At this point the Pittsburg coal vein is known as the River Vein and the coal mined at these mines has been pronounced excellent gas coal as well as steam coal.

This coal is light and clean. It analyzes 61.93 per cent. of fixed carbon, 34.03 volatile matter, 1.20 moisture, 0.54 sulphur and 2.30 ash. When these mines were first opened two wooden tipples were built, but some months ago one of these was destroyed by fire. Before the ruins of the old tipple was removed a new steel tipple had been erected and a second steel tipple is now being put up. The old wooden tipples in the western Pennsylvania coal-fields are being supplanted by steel tipples.

By the time these mines were ready for operations a branch of the Pittsburg, Virginia & Charleston line of the Pennsylvania Railroad had been extended to this new coal-field and thus ample railroad facilities were provided. Shaft mines Nos. 1 and 2 have now been in operation for some time and mines Nos. 3 and 4 are now being rapidly put in shape for producing. Of these two the former is about completed and both will be in operation within a month. In addition to these 4 mines 2 additional shaft mines will be opened near-by shortly and still other mines will be brought in by the Ellsworth Company.

The equipment of the two mines now in operation is strictly modern. In the mines all work is done by compressed air and by electricity. There is the greatest economy in all the processes of mining and handling the coal from the time the coal machines cut into the vein until the product is dumped into the cars below the tipple. At present 6 tons of coal per minute can be hoisted from each mine and as the company will have 9 shafts of this pattern and capacity in the Washington County field; when they are all completed this will give it a capacity of 54 tons per minute, or more than 75,000 tons per day of 24 hours each. At present the company owns enough coal land to keep these big mines in operation for the next 50 years.

The town of Ellsworth has been built with a view to permanency. The town has been incorporated and will soon look more like a model town than a mining village. It contains fine streets which will be well paved; shade trees have been planted, water-works installed and an electric light plant is in operation. Sewers are also contemplated and a big rock crusher is at work and all the streets will be macadamized. A brick plant of 30,000 capacity per day is now operated to its full capacity. Nearly a hundred brick buildings have been erected for the employees. When all the Ellsworth works are in operation they will employ over 2,000 men and Ellsworth will have a population of 6,000 or 8,000. The company has erected a big 3-story office building. A 3-story brick schoolhouse is now being erected and other improve-

ments are in progress. It is the intention of the Ellsworth Company to move the general offices from Cleveland to Pittsburg soon.

This development in the Washington County coal-fields is only one of many. Scores of new mines have been opened during the past 12 months and many more are now being opened. Large tracts of coal lands have been purchased in this field. The Carnegie Steel Company recently began the construction of a road which will intersect the field and connect it with Pittsburg. The Pittsburg Coal Company and the Monongahela Consolidated Coal and Coke Company are both big operators in the Washington County field.

COAL PRODUCTION OF SPAIN.

The coal production of Spain for the past year is reported by the "Revista Minera" as below, in metric tons:

	1899.	1900.	Changes.	Per ct.
Coal	2,600,279	2,680,193	I. 79,914	3.1
Lignite	70,195	92,444	I. 22,249	31.8
Total	2,670,474	2,772,637	I. 102,163	3.4

Of the coal mined in 1900 there were 154,336 tons classed as anthracite. This came chiefly from the mines of the Penarroya District. The production of coal, in tons, by provinces in 1900 was: Burgos, 500; Ciudad Real, 298,410; Cordova, 426,325; Gerona, 31,593; Leon, 265,631; Oviedo, 1,425,000; Palencia, 134,404; Seville, 118,330.

The imports of coal into Spain in 1900 were 1,789,608 tons, against 1,615,000 tons in 1899, showing an increase of 174,608 tons, or 10.9 per cent. The exports amounted only to 8,587 tons, an increase of 503 tons over the previous year.

There were 356,167 tons of briquettes made in 1900, which compares with 386,013 tons in 1899. The largest producer was the Aller Company, which made 121,256 tons last year.

The production of coke in Spain was as follows, in metric tons:

	1899.	1900.	Changes.	Per ct.
Coke made:				
Furnace and foundry coke.....	350,224	369,862	I. 19,638	5.6
Gas coke	170,000	170,000	.....	.....
Totals	520,224	539,862	I. 19,638	3.8

The imports of coke in 1900 were 197,516 metric tons, an increase of 29,072 tons over the previous year. Of the coke produced 174,815 tons were made in Vizcaya and 112,000 tons in the Asturias.

THE MINERAL PRODUCTION OF GREAT BRITAIN.

The advance sheets of the report on the mineral production of Great Britain for the year 1900 have just been received. They give separately the production of the mines worked under the coal mines regulation act and the metalliferous mines act. The statement of the output of the quarries is not yet completed. It will add a little to iron ore reported below. The figures given in the preliminary statement are as follows, in long tons:

	Coal Mines.	Metal Mines.	Total.
Arsenic .....	.....	4,081	4,081
Arsenical pyrites .....	.....	9,573	9,573
Barytes .....	.....	27,456	27,456
Bauxite .....	.....	5,779	5,779
Chalk .....	.....	10,124	10,124
Coal	225,170,163	.....	225,170,163
Clay and shale	181,686	111,570	293,256
Copper ore and precipitate.....	.....	9,088	9,088
Fire-clay	2,944,676	.....	2,944,676
Flint and chert .....	.....	3,721	3,721
Fluorspar.....	.....	1,413	1,413
Gold ore .....	.....	20,802	20,802
Gypsum .....	.....	152,720	152,720
Igneous rocks .....	.....	97,698	97,698
Iron ore.....	7,667,578	1,863,872	9,531,450
Iron pyrites.....	9,078	3,201	12,279
Lead ore.....	.....	31,975	31,975
Limestone.....	28,064	589,042	617,106
Manganese ore.....	.....	1,362	1,362
Ocher, amber, etc.....	.....	4,112	4,112
Oil shale.....	2,282,221	.....	2,282,221
Salt (rock).....	.....	159,860	159,860
Sand	2,215	27,026	29,241
Sandstone	106,594	258,946	365,540
Slate .....	.....	166,636	166,636
Tin ore (dressed).....	.....	6,000	6,000
Uranium ore.....	.....	41	41
Wolfram .....	.....	8	8
Zinc ore.....	.....	24,675	24,675
Total, tons.....	238,291,275	3,590,240	241,881,515

Of the important minerals coal showed an increase over the previous year of 5,084,795 tons. In iron ore there was a decrease of 200,214 tons. Oil shale increased 71,397 tons and zinc ore 1,540 tons. The total increase in tons raised was 4,889,590 tons, or somewhat less than the gain in coal.

The total number of persons employed in the mines is reported as below:

	1900.		1899.	
	Surface.	Underground.	Totals.	Totals.
Coal mines.....	155,829	624,223	780,052	729,009
Metal mines	14,446	20,019	34,465	35,157
Totals	170,275	644,242	814,517	764,166

There was last year a total increase of 50,351 persons employed in mining. This large increase was wholly in the coal mines, the metal mines showing a decrease of 792 persons.

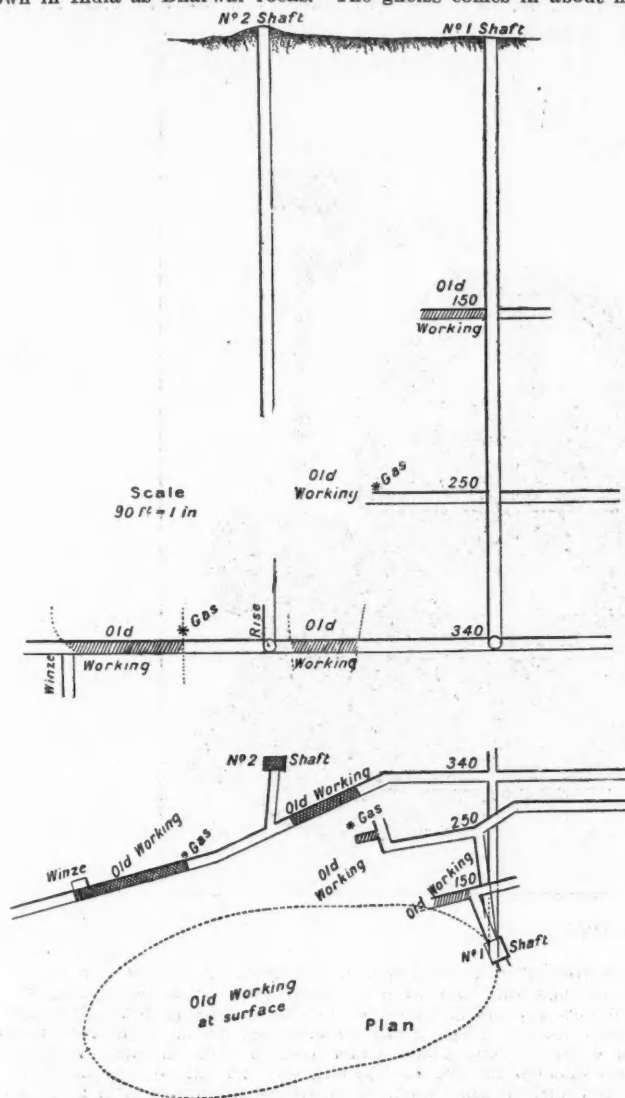
A STEAM COLLIER FOR NOVA SCOTIA.—A steel screw steamer specially designed for the carriage of coal between Louisburg, Nova Scotia, and Boston, was launched recently by C. S. Swan & Hunter, of Wallsend-on-Tyne, England. She will be owned by the English & American Steamship Company, for which C. T. Bowering & Company, of London and Liverpool, are managers. Dimensions are: Length over all, 359 ft.; breadth, extreme, 46 ft.; depth, molded, 30 ft. 1 in. Engines are triple expansion with cylinders of 23½, 39 and 66 in. diameter by 48 in. stroke, steam being generated in two single-ended boilers 16 ft. 6 in. in diameter by 10 ft. 5 in. long, working at 180 lbs. pressure.

EXPLOSIVE GAS IN A METALLIFEROUS MINE.*

By F. W. Grey.

As there are very few recorded instances of the occurrence of explosive gases in metalliferous mines, the following notes on such an event may be of interest. The occurrence was observed in the Hutti Mine, owned by the Hyderabad-Deccan Company, situated in the Deccan, in Hyderabad State. The indications of old native gold workings in various parts of India are very extensive, and in certain districts of the Deccan they are most pronounced. It was with the intention of bottoming and developing a run of such old workings close to the Hutti village, that mining was undertaken here.

The main old working, upon which it was decided to commence operations, was a big pit, about 250 ft. long, 100 ft. wide, and 25 ft. deep, lying nearly N. and S. To the north were further signs of old workings for a distance of about 600 ft. The country rock enclosing the vein which had been worked here (and in which most of the old gold workings are found, though there are some in the gneiss) is a hornblende-schist, practically identical in character with the schists of the Colar Gold-field, known in India as Dharwar rocks. The gneiss comes in about half a



PLAN OF HUTTI MINE, INDIA.

mile to the south, but the width of the schist band, and its extension to the north are not clearly defined, as the whole country is very closely cultivated, large portions of it being black cotton soil, arising from decomposition of the Deccan trap. The schist band is certainly more than half a mile in width, as another run of old workings lies over 2,000 ft. due east of that mentioned above, and runs roughly parallel to it.

In 1895, a vertical shaft was commenced at the north end of the first-mentioned old working, and reached solid ground at about 60 ft.; it was deepened to 150 ft., and there a cross-cut west was driven, which cut old workings at about 20 ft. from the shaft. In the north side of the cross-cut, the vein was still standing though very narrow; but to the south, after some of the debris had been cleared away, the old working was found to be very big and, besides extending to the south, still going down under foot. Sinking was continued to 250 ft., and then a cross-cut west was driven, which intersected the vein at about 65 ft. from the shaft. The vein was driven north for 120 ft., and averaged less than 9 in.; also south for about 60 ft., when it was found that the end was close to old workings again, as from the last hole bored ran a stream of foul-smelling water, and the face was very drummy.

Sinking was again resumed, and at 332 ft. a west cross-cut intersected

the vein at about 90 ft. from the shaft. The quartz was very narrow here, as at the 250 level, and it remained small for the whole length of the north drive, which amounted to 60 ft.; to the south, for 85 ft. of driving, the vein was also small, less than 6 in. wide, when it suddenly widened to 1½ ft. From the last drill-hole here, water of very bad odor came through, and it was evident that the old workers had been beforehand even to this depth, allowing for loss of level in driving, it was equivalent to 325 ft. vertical. Work was again suspended for some time (this was in 1897) but eventually it was decided to break through into the old working at the 250 level, and so drain away the accumulated water down to this depth before opening out at the lower level.

In August, 1898, at 250 ft., on a hole being blasted through into the old workings, a lot of slime and pieces of rock and of timber came into the level. The place was examined shortly after the blasting, and a gang of coolies was taken down an hour later (7 p.m.) to clean up the end; at 11 p.m. the night-shift went on, and worked until 1 a.m., when an explosion took place: a coolie working near the face was so severely burned that he died in 4 days, and two others were seriously injured. At 7 a.m. the mine captain went down with a fresh gang of coolies, and work was carried on until 3 p.m. without any special incident. The afternoon shift then went on, and shortly afterward there was a slight explosion, by which two of the coolies were somewhat scorched, and this so frightened them that they came to the surface. The mine captain went down again and had a good look round, with a naked candle, right into the face, and nothing untoward occurred, but no more work was done until next morning, when he again went down with two coolies; at about 30 ft. along the drive, or half-way between the cross-cut and the face, an explosion suddenly occurred by which the Englishman was very badly burned about the face and hands, and one of the coolies was severely scorched. Work was suspended here for a week, and the debris was cleared, no more gas being observed.

In March, 1899, the old workings at the bottom level (332 ft.) were broken into; much slime and debris came through, but no gas was observed, and no explosion took place. The old workings still going down under foot were about 35 ft. long; then solid ground came in, carrying a quartz vein varying in thickness from 1½ to 2 ft. for a distance of about 55 ft. At this point the quartz in the forebreast was very much fissured, and a good deal of foul-smelling water oozed through; and while the stuff from the last blast was being cleared away, a slight explosion took place. Work was stopped for some hours, a large volume of compressed air was blown in during the night-shift, and operations were resumed in the morning. That gas was still present was evident from the fact of the candle in the end burning with a very large flame; and while the forebreast was being looked over closely by the manager, gas issuing from one of the fissures ignited, and burned all round the back and end for some 5 minutes. More air was blown in for about 4 hours, and an examination was made with safety-lamps; as the issue of gas seemed to have stopped, the end was blasted, and a lot of slime, debris and old timber came through. Compressed air was again blown in for 8 hours; the place was then examined with safety-lamps, and as there were no signs of gas, the work of clearing the debris was begun. It was found eventually that this old working, which was still going down under foot, was 65 ft. in length, and beyond this point the vein was driven on for 25 ft., where it was cut off by a N. W. and S. E. cross-course; no more gas was observed in driving along the old working. The workings are shown in the accompanying diagram.

As to the gas itself, there is little doubt from its behavior that it was marsh gas, although no samples were obtained; as has been stated, many pieces of considerably decomposed timber were found, as well as some bones and horns (the latter doubtless from cattle strayed into the pit), and it is from these organic matters that the gas probably resulted.

Sir Warrington Smyth, in his "Lectures on Mining," states that the occurrence of explosive gas in metalliferous mines is very rare, but that it has been noted in the Van lead-mine, the rock in places, when freshly cut, giving off volumes of gas. He also mentions cases as having occurred in one or two mines in Penzance, Cornwall. Dr. C. Le Neve Foster also mentions the above cases, and some others; and, with regard to the Ding-Day Mine, near Penzance, says the gas was found in the opening up of an old level that had been a long time under water.

In all operations to connect with very old workings at considerable depth, it would seem advisable, when communication is being effected, to take the precaution of using safety-lamps for a time, and thus avoid risk of injury to the men and workings.

LARGE ORE CARS IN ENGLAND.—The Furness Railway Company in England, says the London "Engineer," is trying an experiment with some bogie steel wagons for the conveyance of iron ore. These wagons will carry 40 tons of ore with a tare of only 12 tons 7 cwt., and one wagon will accomplish the work of four ordinary ore wagons. At present these wagons are only running between Barrow docks and the Barrow Steel Company's works. As they have proved a success the directors state that they may have to ask the other iron industries in the district to carry out certain alterations at their works to enable them to order more of these wagons, so that they may be used generally on the line.

IRON AND STEEL EXPORTS OF GREAT BRITAIN.—The values of iron and steel exported from Great Britain in all forms, for the two months ending February 28th, are given by the Board of Trade returns as below:

	1900.	1901.	Changes.	Per ct.
Iron and steel.....	£5,246,030	£3,939,141	D. £1,306,889	24.9
Machinery	2,983,539	2,750,261	D. 233,278	7.8
New ships.....	879,575	798,605	D. 80,970	9.2
Totals	£9,109,194	£7,488,007	D. £1,621,187	17.8

Part of the decrease in values is due to the lower range of prices prevailing this year.

*Paper read before the Institute of Mining and Metallurgy, London, February 20th, 1901.

THE LITCHFIELD ENDLESS ROPE HAULAGE ENGINE.

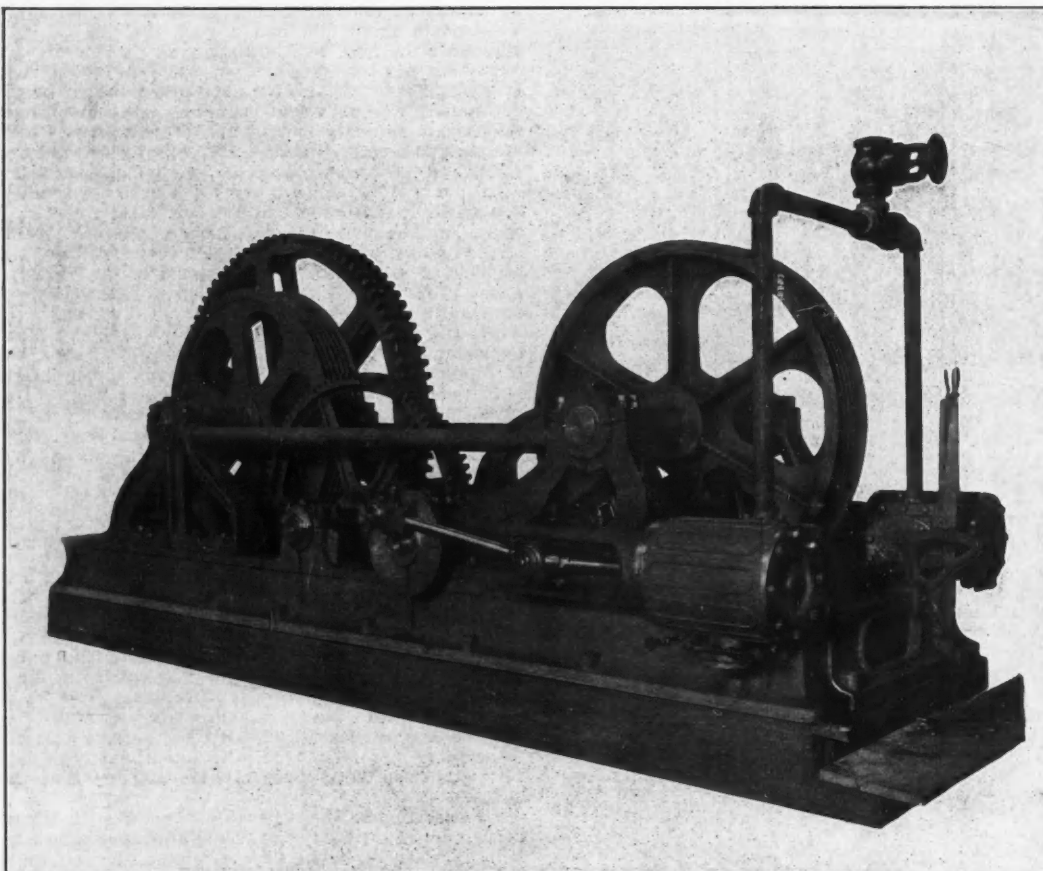
The accompanying cut represents an endless rope haulage engine just installed by the Litchfield Foundry and Machine Company for the Erie Railroad Company at the coal docks at Hammond, Ind. The company has also installed a number of these engines at coal and metal mines and they are giving good results in reducing the cost of mining. This company also builds the well known "Litchfield" first motion hoisting engine, which is giving good results wherever used. There are over 200 pairs of these engines in coal and metal mines in this country, Canada and Mexico. The Litchfield Company has been building first motion engines since 1877, and has improved on them from time to time until they are now almost a perfect machine in every particular. One point on these engines to be noticed is the balanced valve. It is so constructed that the engineer can reverse the engine with one hand easily while the engines are working under full steam pressure. Every hoisting engineer and mine manager understands the advantage of having an engine of this kind, as an overwind of the rope is almost an impossibility.

This company also built and installed the three haulage plants at the Pittsburg & Conneaut Dock Company's docks, Conneaut, O. It

trace of copper, and carries, most of it, from 0.1 to 0.3 oz. of gold to the ton.

But below this, in the copper zone, results are more diverse. In one of the faulted sections of the lode the copper zone is formed of sulphide ore, carrying a highly payable percentage of copper, gold and silver, and suitable for direct smelting; but in the other sections, so far as yet proved, the copper-bearing ore is silicious and has to be treated by concentration. At Cobar, so far, the loss from this source has been at least one-half. When we deduct this 50 per cent. loss from an ore running, say 3.5 per cent., and take note, besides, of the scarcity of water, the heavy cost of railway freight in shipping the concentrates, and the cost of smelting them elsewhere, it can easily be seen that there is no profit remaining. This is the problem which every mine at Cobar, except the Great Cobar, has to face. One mine, Cobar Chesney, having developed a quantity of this silicious copper ore, erected a costly concentrating plant to treat it, and with a loss of 50 per cent. in concentrating, is working without profit. The other mines, with no capital to put into experimental plants, are leaving the copper zone alone, and are making what profits they can by working out the gold ore above.

The one exception to this is the Great Cobar Copper Mine. In this property, owning one of the faulted sections of the main lode, the copper



LITCHFIELD HAULAGE ENGINE.

also built and installed a very large coal haulage plant at the Cottonwood Coal Company's mines, Stockett, Montana.

THE COBAR GOLD-COPPER FIELD, NEW SOUTH WALES.

The New South Wales correspondent of the London "Economist" says that the mining district of Cobar lies about 470 miles west of Sydney, in the center of a vast, drought-stricken plain, and has a population of 3,000 or 4,000 persons. The surrounding plain has been cleared of grass by the drought, and of timber by the woodcutters—for the mine boilers—so that the slight ridge which runs for some miles, and along which the main Cobar lode outcrops, can be seen from a considerable distance.

This main lode of the Cobar Field is a remarkable mineral deposit. It is of great width, being in many places 40, 60 and even up to 100 ft.; it undoubtedly goes to a great depth, and it can be traced on the surface for a number of miles. Throughout its length it is broken into a series of step faults, some of which throw it quite half-a-mile from its course, but its tendency is always to resume its normal direction, and these faults do not, therefore, greatly interfere with its general regularity. But the most extraordinary feature about the Cobar lode is that on the surface and to a depth of perhaps 250 ft., it is a gold-bearing lode pure and simple, and below this it turns into a copper lode, carrying not only copper, but silver and lead in places, and an appreciable amount of gold throughout. Unfortunately, it lies hundreds of miles from the sea and from coal. Water, too, is scarce, and as most of the lode is of low-grade value, the Cobar Field may said to be handicapped very severely.

Exploratory works on the Cobar Lode have shown varying results. For a depth of 200 or 250 ft. lies the oxidized gold-bearing lode matter, which is really a capping to the mineralized lode beneath. This gold-bearing ore in free milling, or treatable by cyanide, contains hardly a

zone, instead of being silicious, is a mineral ore which can be treated by direct smelting, and while carrying little or no more copper than the silicious ore, can be easily worked to produce profits. This mine is, of course, the mainstay of the whole Cobar Field. Whether this lode can be made to yield profits commensurate with its size and its metal contents depends on whether the silicious ore can be concentrated at a profit, and also on the regularity of the water supply, which at present is absent.

The Great Cobar Mine was, a few years ago, let on tribute to a small party of men. These tributors have bought up nearly the whole of the shares in the mine, and when the term of the tribute comes to an end they will appear as practically the entire owners of the property. This mine is developed to about 700 ft. deep, and at that depth is about as valuable as it has ever been. There are three leases of payable ore, aggregating about 700 ft. long, by perhaps 30 ft. wide, and showing no signs of diminution in depth. The ore now in sight may roughly be placed at about 700,000 tons. But the chief feature about the mine is its economic advantages for smelting. A mixture of the oxidized gold-bearing ore near the surface and of the sulphide mineral ore in the copper zone makes an almost ideal flux in the furnaces. Thus the gold ore, which otherwise would be unpayable, is not only used as a flux, but produces about \$2.50 a ton in gold, and the sulphide ore, which also by itself would be unpayable, being provided with a suitable flux is made to produce nearly 3 per cent. of copper per ton and both gold and silver. It may further be added that the tributors can procure elsewhere along the line of reef an abundant supply of gold-bearing flux when theirs is exhausted, and that they own in other parts of the Colony mines which yield the coal and coke which they use at their Cobar smelter. At present the production from the Great Cobar Mine is about 9,000 tons of ore a month.

Next to this mine, but on another of the faulted sections of the lode, is the Cobar Gold Mines. Here no attempt has been made to sink a

shaft and explore the copper zone. Work is entirely confined to the gold-bearing ore near the surface, which is here of great width, and of rather better value than the average. A battery of 100 stamps, the largest in the colony, crushes about 6,000 tons a month, and there is doubtless ore in sight to last for a number of years. The mine is well handled, well timbered, well developed—as to the yield per ton and cost of working the manager of the company was reticent. At present a large proportion of gold is going into the slimes, but a plant is in course of erection to treat these. When the slimes are treated probably the total extraction will reach nearly \$5 a ton, and the total cost will probably be \$3.75 a ton. This is, of course, a very low-grade mine; but presumably it will earn profits, and there is undoubtedly a great mass of ore to work on. As yet the company does not know the value of its copper zone, nor whether the ore is a mineralized or silicious ore.

The next mine, on another faulted section of the lode, is the Cobar Chesney. Here a mass of low-grade gold-bearing oxidized ore is exposed, of too low grade to treat separately, and below it a still greater mass of silicious copper-bearing ore. Concentration of this copper ore has, so far, been a failure; but the plant is being altered, and it may be found that the ore, which carries about 3 per cent. copper with a little gold, will just yield a slight profit. This mine is now the test mine of the Cobar Field. If it can concentrate the copper pyrites payably, there are millions of tons along the line of lode ready to be treated; if it cannot, the smaller mines will have to finally shut down.

Beyond this are the Young Australian, Cobar Great Western and Occidental. These are all locally owned mines, with no capital to undertake exploratory work in the copper zone, and their workings have been confined to the gold ore near the surface. At the Occidental the gold ore has proved payable, and the working has taken the form of an open cutting to a depth of 150 ft., the walls of the lode standing on each side vertical and true. Still further on the lode is lost, and the Cobar ridge again merges into the immense desolate plain.

MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like, will be reproduced whenever possible. Specimens should be of moderate size, and should be sent prepaid. We cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

317.—Experiments on Chalcopyrite.—The state of oxidation of the iron in pyrite, marcasite and arsenopyrite has received considerable attention. In the "Journal of the American Chemical Society," Leonard P. Morgan and F. Smith describe the result of some experiments made in chalcopyrite. Several analyses showed from 30.63 to 30.72 per cent. of iron. The formula generally assigned the mineral is CuFeS_2 , which would require 30.5 per cent. of iron. The results obtained indicate a complete decomposition of the material by hydrochloric acid, and also show that all of the iron is in the ferrous state. This proved to be the case with marcasite. As hydrochloric acid gas does sometimes act as a reducing agent, there was a possibility that perhaps it might have transformed any ferric iron present in the mineral into the ferrous condition, but further tests corroborated the first experience and it can safely be asserted that chalcopyrite contains all of its iron in the ferrous form, and that the mineral is, perhaps, nothing more than a substituted marcasite, in which copper has replaced its equivalent of iron.

318.—Volcanic Glass.—I. H. A.—The black mineral is volcanic glass or obsidian. It may have come from a rhyolite flow, but is clearly not a vein formation and probably contains no mineral of value.

319.—Corundum.—We have received from C. E. McCoy, of Belgrade, Mont., specimens showing corundum crystals in a pegmatitic rock. The corundum crystals are well defined, of grayish-green color, with marked cleavage, and though not of large size, make pretty cabinet specimens.

320.—Sperrylite.—An analysis of this mineral from Vermillion Lake, Township of Denison, Ontario, by Professor H. L. Will, of Yale, gave the following results: Arsenic, 40.98; antimony, 0.50; platinum, 5.57; rhodium, 0.72; palladium, trace; iron, 0.07; oxide of tin, 4.62, according to the Ontario Bureau of Mines.

321.—Specimens from Virginia.—E. C.—No. 1 shows a quartz vein in granite. Granite is considerably weathered. No. 2 is a schist. The red color is due to iron oxide. The green mineral is chlorite. No. 3 is too weathered to determine, may have been a schist like No. 2. The red color is due to iron oxide. No. 3 is an magnesian silicate, approaching steatite in composition. No. 4 is too small for determination. It is probably granite. No. 5 is ordinary, milky quartz. None of the specimens shows any signs of carrying any mineral of value.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Manganese and Quicksilver.—What would be the effect if quicksilver comes in contact with manganese and water combined?—E. A. C.

Answer.—Ordinary manganese ore will have no effect on quicksilver. There will be no more action than with iron ore.

Graphite.—Is there much demand for graphite? What is the present value in New York? Where does the present supply come from? I am

interested in a graphite deposit in Colorado and would like to know if it can be mined at a profit.—J. H. A.

Answer.—There is a good demand for graphite. The consumption in the United States in 1899 amounted to 22,609 tons of refined graphite and 1,030 tons of amorphous graphite. In 1900 it slightly exceeded those figures. In 1899 there were 1,816 tons of refined and 1,030 tons amorphous mined in the United States, while 20,793 tons were imported, the larger part coming from India. The prices of graphite in New York are given in our columns weekly. The value of a deposit in Colorado would depend on its quality and on the shipping facilities.

Weight of Quartz.—What is the average weight of quartz? In place and broken or ground?—S. S.

Answer.—The usual estimate for ordinary quartz in place is from 12 to 14 cubic feet to the ton; that is, from 143 to 167 lbs. to the cubic foot. The weight would, of course, be increased where the quartz included much mineral, such as galena, pyrites, etc. Some actual determinations of weights of ground quartz reported by Messrs. E. M. & M. L. Wade, of Los Angeles, Cal., are as follows: Quartz ground to pass through No. 30 screen, 99 lbs. to the cubic foot. Ground to pass No. 60 screen, 98 lbs. to the cubic foot. Ground to pass No. 100 screen, 94 lbs. to the cubic foot.

Complex Tin Ores.—Do you know of any place from which complex sulphide tin ores, containing antimony, arsenic silver and lead, or any of them, can be obtained in large quantities?—S. V.

Answer.—In still further answer to this question, which appeared in the "Engineering and Mining Journal" November 24th, 1900, Mr. G. H. Blakeman writes us from Einasleigh, North Queensland, as follows: "In answer to the above query I have to say that there is a mine owned by the Conrad Silver Mining Company, at Bara Creek, near Inverell in New South Wales, which produces a concentrated ore assaying as follows: Copper, 14 per cent.; tin, 11; lead, 7 per cent.; silver, 95 oz. per ton, with a good percentage of arsenic, about 1 per cent. antimony and 1 to 2 per cent. zinc—all sulphides."

Shell Deposits.—While prospecting on a California desert about 10 years ago I encountered a very extensive deposit of shells. At that time I simply regarded it as a great natural curiosity, but have recently been led to consider that it may have commercial value as a phosphate proposition. These shells are all of the small spiral variety, about 1/2 in. in length, and the mass has become solidified into a sort of cement. This bed or deposit has been fractured in many directions, thus forming narrow gulches which expose the deposit on either side and show it to be from 20 to 40 ft. in thickness. How much more of it there may be under foot I cannot say. This deposit is all shells, there being no sand, gravel nor anything else mixed with it. At that time I did not estimate its probable extent, but there must be several thousand acres of it. A projected railroad which is certain to be built in the near future would be able to land the product at a seaport, with considerably less than 100 miles haul. I should be glad to have your opinion as to whether or no it merits serious consideration.

Answer.—Such a shell deposit as you describe would not carry a high percentage of phosphate of lime, as a rule, and would command only a low price. If it could be delivered cheaply it could be used as a filler in making commercial phosphates. Old shell deposits are used for that purpose by the Belgian manufacturers. You had better secure some good samples of the deposit and have them analyzed and examined by a competent fertilizer chemist.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

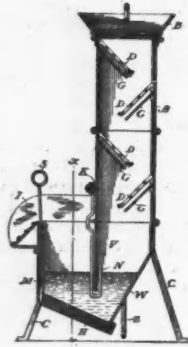
The following is a list of the patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending March 12th, 1901.

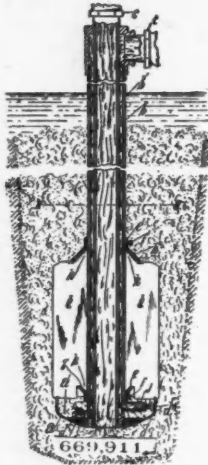
- 669,508. ENDLESS ADJUSTABLE SCREEN. William Collier, St. Paul, Minn., assignor of one-half to Samuel E. Mills, Minneapolis, Minn. A separating device comprising in combination, two pairs of endless carriers, such as chains, guiding and driving wheels for such chains, two series of overlapped slats, secured one series to each pair of endless chains, said slats having perforations or meshes adapted to be opened or closed by the adjustment of one pair of chains with respect to the other.
- 669,567. APPARATUS FOR ENAMELING SURFACES OF REFRACTORY MATERIALS. Charles H. Waterman, Pompton Plains, N. J. The combination of an electrical converter having a broad heating surface and mechanism for presenting a surface of refractory material in a plane parallel to said heating surface in proximity thereto, but out of contact therewith, whereby the enamel is immediately fused to the surface of refractory material upon which it is imposed by a uniform degree of electric heat applied simultaneously and instantaneously over all parts of the enamel.
- 669,571. ELEVATOR AND CONVEYOR. Edward C. Berghoefer, Milwaukee, Wis. In combination, an endless carrier, hoppers fixed on and traveling with the carrier, the hoppers having ends open in a direction substantially at right angle to the plane of the carrier, and buckets hinged to the hoppers so as to be adapted to receive material therefrom.
- 669,589 and 669,590. PUMP. Clarence L. Parker, Los Angeles, Cal., assignor of one-half to Irwin W. Ross, San Francisco, Cal. The combination of the pump tubing, a pump rod formed in sections, a plunger, a plunger bracket, having a hub connecting adjacent sections of the pump rod, a guide ring secured on the hub of the bracket, adapted to operate within the plunger, and a valve on the pump rod beneath the plunger and adapted to raise the same.
- 669,637. PROCESS OF MAKING CHLORATES. James Hargreaves, Farnworth-in-Widnes, England, assignor to the General Electrolytic Parent Company, Limited, same place. The method consists in hydrating carbonate of soda crystals, constituting the same into a mass of such a character as to permit of easy permeation by the chlorine, charging the mass of hydrated carbonate of soda into an absorbing tower, and passing chlorine through the said hydrated soda; the soluble salt or chlorate being taken into solution and conducted away while the insoluble salt is left undissolved.
- 669,640. ELECTRICALLY-OPERATED PUMP. Edward M. Hewlett, Schenectady, N. Y., assignor to the General Electric Company, of New

York. A fluid-pressure system comprising a pump, an electric motor for driving the same, a governor responsive to fluid pressure, a circuit controller operated thereby, a valve for reducing pressure on the pump when starting, and an electromagnet controlled by the governor for operating the valve.

- 669,650 and 669,651. **PROCESS AND APPARATUS FOR ENRICHING GAS.** Robert L. Middleton, Washington, D. C., assignor, by mesne assignments, to John R. McLean, Cincinnati, Ohio. A device comprising a casing having a closed end and an open end, and a pipe leading through said closed end and extending longitudinally of the casing to near the opposite end thereof, and having a return bend with an outlet located adjacent to said closed end.
- 669,671. **GRAVITY AMALGAMATOR.** John Tobin, Brooklyn, N. Y., assignor of one-half to George N. Joyce, same place. The combination with a mercury pot adapted to contain a body of mercury, and means for supporting the pot, of a diaphragm dipping below the surface of the mercury, extending across the pot and dividing it into two



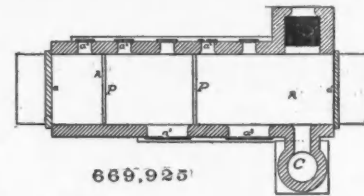
669,671



669,899

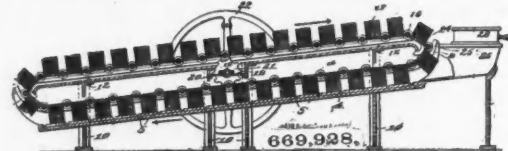
- chambers, and a stand-pipe covering one of said chambers, and of such a height that the column of pay dirt contained in it will overcome the resistance to the passage of said dirt through said mercury, and a removable amalgam pot within the mercury pot.
- 669,696. **APPARATUS FOR CASTING METAL.** John B. F. Herreshoff, Brooklyn, N. Y., assignor to the Nichols Chemical Company, New York, N. Y. The combination of a series of molds, each having a liquid-circulating system, with means for causing the said molds to travel in a closed path, a stationary platform supported within the path of travel of the molds, a water-supply pipe forming the pivot of the system of molds, located beneath the platform and in liquid-conducting communication with the liquid-circulating systems of the molds, a furnace or other source of molten-metal supply, and a trolley-supported ladle arranged in operative relation with the furnace and the moving molds.
- 669,698. **PROCESS OF DRAWING METALLIC TUBES.** Ellwood Ivins, Philadelphia, Pa., assignor to Frank A. Wilmot, Bridgeport, Conn. The process consists in first annealing the tubes, then pickling the same, then coating the surfaces with anti-friction metal, then drawing the same through suitable successively smaller dies without any intermediate annealing or pickling or fresh coating with soft metal, and finally removing the soft metal coating.
- 669,705. **READING DEVICE FOR SURVEYING OR OTHER INSTRUMENTS.** Reinhard Reeh, Wetzlar, Germany. A bore in each trunnion, a vertical and a horizontal circle in combination with tubes extending from the bore of the trunnion into close proximity with the said circles, lenses, prisms and scales in said tubes, a lens made in two sections and mounted in the telescope to contract and convey the rays from the said prisms to the lenses of the telescope.
- 669,733. **APPARATUS FOR ROLLING AND DRAWING CYLINDRICAL RODS, SHAFTS, ETC.** James M. Perry, Pittsburg, Pa. The combination of two vertically-disposed rolls, each of which is provided with a semi-circular groove opposed to each other, and having their edges corrugated and adapted to overlap the sides of the rod or bar on a horizontal plane slightly below the axes thereof.
- 669,750. **METHOD OF MAKING ZINC-WHITE.** David B. Jones, Chicago, Ill. The method consists in imparting a cyclonic swirl to a mixed charge of powdered ore, fuel and flux by projecting it tangentially in divided masses through aid of an air blast into the furnace, setting the charge aflame, expanding the resultant pigment fumes and combustion products freely upward toward the exit and simultaneously separating and trapping the associated non-volatile constituents or slags by arrest thereof during the centrifugal swirl.
- 669,752. **ELECTROLYTIC APPARATUS.** Paul W. Knauf, Philadelphia, Pa., assignor to the Electrical Lead Reduction Company, same place. The combination of a series of superposed metallic receptacles, each having its lower portion of less diameter than the upper edge, and each having an exterior peripheral seat arranged below said upper edge but conforming throughout its whole extent with such edge.
- 669,853. **AIR-COMPRESSING OR BLOWING ENGINE.** Gustav B. Petsche, Philadelphia, Pa., assignor to the Southwark Foundry & Machine Company, same place. In an air-compressing engine the combination with a positively-driven eccentric, and a link actuated thereby, of a slide in which the arm of the link is pivoted, a slide arranged to be adjusted toward and away from the link, a pair of links pivotally connected together and connected also with the arm of the first link, and with the slide and a valve-actuating connection extending from an intermediate point on said links to the air-admission-valve mechanism of the compressing cylinder.
- 669,859. **WATER-COOLED BOSH FOR BLAST FURNACES.** Axel Sahlin, Millom, England. In a blast furnace, a bosh, provided with an open external spiral trough or runway for the passage of a current of cooling water.
- 669,862. **CRUCIBLE.** Porter W. Shimer, Easton, Pa. A crucible having an internal gasket, an external cooling chamber arranged approximately opposite the crucible gasket, and means for circulating a cooling medium through said chamber.
- 669,873. **GOLD-SAVING MACHINE.** Thomas Bell, Vancouver, Canada. A tank having a bottom sloping slightly down from each side toward the center; a V-shaped partition in such tank dividing it horizontally into two parts; a cylindrical opening in the center of such partition; a conical amalgamator adapted to float within the cylinder on the water in the tank, and adapted to rotate therein on a vertical axis, and means whereby the water and sand are introduced to the lower and the tailings withdrawn from the upper divisions.
- 669,897. **APPARATUS FOR PREPARING AND FEEDING FUEL.** Albert A. Day, Brooklyn, N. Y. The combination with a pulverizing chamber

- of an ejector chamber arranged at one side, ejecting mechanism and a fuel connection.
- 669,899. **NICKEL SALT AND PROCESS OF MAKING SAME.** Hans A. Frasch, Hamilton, Canada. A nickel salt, consisting of a double salt of nickel-ammonium chloride and four equivalents of free ammonia. Also the process of producing such salt, consisting in combining ammonia in excess with a salt of nickel, and precipitating such ammonium-nickel salt from a solution by means of a salt capable of displacing the same.
- 669,909. **MINE CAP FOR DRAFT ANIMALS.** Albert C. Young, Amesville, Ohio. A shield protecting the crown and eyes of a horse or mule employed underground.
- 669,911. **HYDRAULIC AMALGAMATING MACHINE FOR EXTRACTING GOLD FROM SAND IN PLACE.** Grove S. Bartholomew, Los Angeles, Cal.; E. A. Beck, administrator of said Bartholomew, deceased. A machine comprising a cup, means for discharging water below the cup, means for discharging water into the cup above the bottom thereof, and amalgamating plates above the bottom of the cup.
- 669,922. **MEANS FOR THE PREVENTION OF INCRUSTATION IN BOILERS.** Jacob Gottlob, Cologne, Germany. An electric circuit passing through a boiler having a positive connecting wire and a series of electrodes suspended in the boiler.
- 669,925. **PROCESS OF TOUGHENING MANGANESE STEEL.** Henry D. Hibbard, North Plainfield, N. J. A process consisting in first establishing, in a heating apparatus, a series of consecutive heating zones having temperatures increasing gradually from a low predetermined temperature which will not injure the articles to a high heat, and maintaining the temperature of each zone at a substan-



669,925

- tially uniform degree, then introducing the articles successively into the zone of lowest temperature and moving them through the consecutive zones so as to subject them to a gradually increasing temperature, preventing the products of combustion from coming into contact with the articles in the zones of lower temperature and permitting said articles to come into contact with the said products of combustion during their passage through the hottest zone, and finally withdrawing said articles from the hottest zone and plunging them into a cooling bath.
- 669,926. **PROCESS OF ELECTROLYTICAL EXTRACTION OF METALS.** Carl Hoepfner, Frankfurt-on-the-Main, Germany. A process which consists in placing a soluble metallic anode other than iron or zinc in a solution of a salt capable of dissolving the same, placing a suitable cathode in a second solution containing a metal other than that contained in the anode, interposing a third solution between the two first mentioned, separating the solutions by means of suitable diaphragms, passing a current, thereby bringing the anode metal into solution, and depositing the cathode metal, precipitating the anode metal from the anode solution enriching it in cathode metal, and conveying the resulting solution to the cathode compartment.
- 669,928. **DRY-WASHING MACHINE FOR GOLD.** Lemott D. Hubbard, Chicago, Ill. A bed plate arranged at an inclination and provided on its upper face with a series of transversely-extending grooves for



669,928

- containing mercury, an endless brushing apparatus consisting of a series of brushes suitably spaced apart and pivotally connected together, and adapted to contact with and pass over said upper surface of the bed plate.
- 669,952. **MOLD FOR STEEL CASTINGS.** Walter Brinton, Highbridge, N. J., assignor to Taylor Iron & Steel Company, same place. A mold for producing castings, comprising a metallic portion to chill the contained metal, a sand portion to permit more gradual cooling of the metal adjacent thereto, and an intermediate zone composed of continuations of the metallic and sand portions of the mold in juxtaposition, and both exposed to contact with the incoming molten metal, and arranged to decrease the rate of cooling of the adjacent metal of the casting from the chill to the sand part of the mold.

Design Patent 34,214. **ROCK-DRILL BIT.** Henry Aylmer, Sherbrooke, Can-



34,214

ada. Term of patent, 14 years. The design for a rock-drill bit, as shown in the accompanying drawing.

GREAT BRITAIN.

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

Week Ending February 16th, 1901.

- 2,994 of 1900. **ELECTRO-DEPOSITION OF NICKEL.** M. Kugel, Berlin, Germany. A method of electrolytically depositing nickel in thicker layers than hitherto possible.
- 6,926 of 1900. **GLASS-MAKER'S CRUCIBLE.** L. M. Regie, Nesle, France. A crucible for glass-makers, in several compartments, so as to obtain a continuous supply of glass.
- 7,210 of 1900. **INCANDESCENT LAMP.** C. A. von Welsbach, Vienna. Improvements in the inventor's osmium filament for incandescent electric lamps.
- 22,591 of 1900. **MAGNETIC SEPARATOR.** C. A. Barnard, Moline, Ill., U. S. A. Detailed improvements in the inventor's magnetic separator.

PERSONAL.

Mr. J. G. Jacobs has returned to Bingham, Utah, from Los Angeles, Cal.

Mr. Geo. W. DeWitt, a mining man of Baker City, Ore., is in San Francisco.

Mr. Don S. Rae, a mining man of Granite, Mont., is visiting Grant's Pass, Ore.

Mr. H. S. Manning, of Manning, Maxwell & Moore, of New York City, has returned from a trip to Cuba.

Mr. D. I. Nickerson, of the Butte & Boston Mine at Republic, Wash., has returned there from Hailey, Idaho.

Mr. Edwin Durant, who has been financial manager at Rossland, B. C., for the British America Corporation, has returned to England.

Mr. H. A. Keller, consulting engineer, late of Philadelphia, has been appointed manager of the Trinity Copper Mines, of Shasta County, Cal.

Mr. John Banbury, mining expert, of Auckland, New Zealand, is in San Francisco en route to London to report on gold and cinnabar properties.

Mr. James Clayton, of the Calumet Gold Mining and Milling Company, operating in Gilpin County, Colorado, is making a business trip to Pittsburg, Pa.

Mr. G. C. Hewitt, mining engineer of Colorado Springs, Colo., recently returned from a 10 days' trip in the San Juan country, where he examined two properties for New York clients.

Mr. Martin J. Heller, mining engineer, representing Capt. J. R. De La Mar, has lately returned to San Francisco after examining properties in Chiapas and Chihuahua, Mexico, and in Arizona.

Mr. J. G. Black, of Dunedin, N. Z., who was at Angels, Cal., working on a plan to extract gold from sulphurets without the use of chlorine gas, at the Lightner plant there, recently returned to New Zealand.

Mr. J. Cuyas, manager of the Mexican Department for the Ingersoll-Sergeant Drill Company, who has been in New York City for more than a month, left last week for Mexico City to resume his duties there.

Mr. S. Oshima, director-general of the Imperial Steel Works of Japan, has been in Pittsburg placing a number of important contracts for equipment, etc. He was to sail from Vancouver, B. C., for Japan on March 27th.

Mr. James Glanville, who was recently engaged to superintend the construction of the new Champion Mill, will take Mr. Burgan's place at the Isle Royale. He was formerly assistant superintendent of the Tamarack-Osceola Mine.

Mr. A. L. Burgan, superintendent of the Isle Royale Mill, near Houghton, Mich., has been appointed superintendent of the Tamarack-Osceola Mills in place of Mr. Charles H. Krause, who recently resigned. He will assume charge on April 1st.

Mr. W. A. May has been appointed general manager of the Pennsylvania Coal Company and the Hillside Coal and Iron Company, with office at Scranton, Pa. Mr. W. W. Inglis has been appointed superintendent of the Hillside Coal and Iron Company at Scranton.

Mr. J. J. H. Teall has been appointed director-general of the geological survey of Great Britain and Ireland, in succession to Sir Archibald Geikie, who retired on February 28th. Sir Archibald had been in the service of the Survey for 46 years and had reached the age limit.

Mr. H. P. Harmon, who represents an American and Chilean syndicate, is in San Francisco, en route from Valparaiso to New York. The syndicate is constructing a railroad from Calera to Uasagua to develop the nitrate deposits and the mining and timber regions of the Northern Provinces.

Prof. S. W. Stratton, of the physics department of the University of Chicago, has announced that as he has been appointed director of the new standardizing bureau at Washington he will resign his professorship, to take effect in April or July. He will go to Europe to study systems of weights and measures in France, Germany, England and Austria.

Mr. Richard A. Parker, mining engineer, has changed his office address from 8 Congress street to 4 Post Office square, Boston, Mass. The same change of address applies to the offices of the United States Mining Company, Centennial-Eureka Mining Company, American Zinc Lead and Smelting Company and the United States Oil Company.

Mr. A. L. Schultz, formerly president and general manager of the Schultz Bridge and Iron Company, Pittsburg, Pa., has been appointed to

take charge of the operating department of the American Bridge Company, covering the Pittsburg District, comprising the Keystone, Pittsburg, Schultz and Shiffler plants at Pittsburg; the Wrought Iron Plant at Canton, O.; the new Columbus Plant at Columbus, O., and the Youngstown Bridge Company Plant at Youngstown, O.

Mr. L. T. Beecher, who will be secretary and treasurer of the Tennessee Coal, Iron and Railroad Company, is in Birmingham, Ala., acquainting himself with his duties and with the affairs of the company. Mr. Beecher comes from the Minnesota Iron Company, where he was secretary, and succeeds Mr. James Bowron. Mr. D. H. Bacon, the chairman of the executive committee of the Tennessee company, came from the Minnesota Iron Company and called Mr. Beecher. That the Minnesota Company is an asset of the Federal Steel Company and thus of the United States Steel Corporation was the only basis for the rumor that the Tennessee Coal, Iron and Railroad Company would be directly or indirectly interested in the United States Steel Corporation.

OBITUARY.

James Hammond, owner of the Hammond gold properties in the Rainy Lake District, Ontario, was accidentally killed recently by a boiler that was being installed falling upon him.

George Pratt Starkweather, assistant professor of applied mechanics in the Sheffield Scientific School, of Yale University, died at his residence in New Haven March 21st of a complication of diseases ensuing from an attack of the mumps. He was 23 years of age and unmarried.

Arthur Wellington Ross, a prominent character of the Canadian northwest, died March 23d in Toronto from paralysis. He was born in Nairn, Ont., in 1846 and studied at the Cornwell High School, the Toronto Normal School and Toronto University. He took up the practice of law in Manitoba in 1878. He made large investments in British Columbia lands and in 1881 was associated with the Howard syndicate that offered to build the Canadian Pacific Railway. As a representative in the House of Commons he advocated the development of British Columbia. In 1895 he returned to Toronto and in 1898 instituted the firm of A. W. Ross & Company, mining brokers. Returning to the west, Mr. Ross became general manager of the North Star Mining, Trading and Transportation Company, a position which he occupied until recently. He also became interested in several new mining concerns in the west and in Rossland. He leaves a widow and 2 sons, Messrs. John Hugo Ross, of the firm of Sawyer, Ross & Company, mining brokers, and Donald A. Ross, mining engineer.

SOCIETIES AND TECHNICAL SCHOOLS.

The Case School of Applied Science at Cleveland, O., which offers courses in architecture, chemistry, civil engineering, electrical engineering, general science, mechanical engineering, mining engineering and physics, shows in its annual catalogue a total registration of 267 students. The catalogue also states the tuition fees, necessary expenses, etc.

New York University.—The university at Fordham, New York City, issues a bi-weekly bulletin giving the annual college announcement, the degrees conferred in 1900 and the announcements and catalogues of the 10 schools comprised in the university. The School of Applied Science offers courses in civil engineering, mechanical engineering, chemical engineering, marine engineering. These courses include instruction in mechanical drawing, shop work, chemistry, physics and geology, mathematics and modern languages.

Society of Chemical Industry—New York Section.—At the regular meeting on March 22d at the Chemists' Club, Clifford Richardson, of the New York Testing Laboratory, Long Island City, presided. Papers were read by Clifford Richardson on "Uniformity of Technical Analysis," and A. P. Van Gelder, on "Notes on Nitric Acid and Mixed Acid Analysis." Mr. Richardson suggested that practical steps could be taken toward securing uniformity of analyses, and the matter will be discussed at a future meeting, a committee being appointed in the meantime to consider what can be done.

It was announced that Columbia University had decided to allow the chemists of the city the use of its chemical books and journals Wednesday and Saturday evenings the present year, as an experiment.

Previous to the meeting the usual informal dinner was held at the Hotel Grenoble. The meetings of the section will be held in future at the Chemists' Club, instead of the College of Pharmacy.

INDUSTRIAL NOTES.

The Rogers Locomotive Works, of Paterson, N. J., has been sold to New York men by the receivers. The purchasers will increase the capacity of the works.

The American Bridge Company, of New York City, has secured the contract, through the Schultz Branch of Pittsburg, for a large government warehouse at Progreso, Yucatan.

Messrs. Fraser & Chalmers, of Chicago, have secured a contract to equip a smelting plant at Torreon, Mexico. About \$125,000 worth of machinery, etc., will be required for the undertaking.

The Birmingham Machine and Foundry Company, of Birmingham, Ala., has received an order from Cuba for 7 Corliss engines, which, it is stated, will cost when completed nearly \$100,000. The engines are to be used on sugar plantations.

The New Jersey Foundry and Machine Company, of New York City, has secured a large order for the shipment of trolley hangers, overhead trolley tracks and conveying machinery to Western Australia for use in the dock warehouses at Perth.

The Williams Patent Crusher and Pulverizer Company, of St. Louis, Mo., has opened up a branch office in charge of Mr. M. J. Williams in the Temple Court Building, Chicago, Ill., where it will meet any who contemplate installing grinding machinery.

The Farrel Foundry Company, of Ansonia, Conn., recently turned what is said to be the largest casting ever made in New England. It weighed 50 tons and is intended for an engine bed. It will have to be taken to its destination in Rhode Island on a special car.

The company is at present busy filling orders for Europe and recently booked orders for Durango, Colo.; Allegheny City, Pa.; Abbotts, Ark.; San Francisco, Cal.; Newport, Tenn.; Buena Vista, Va.; Big Stone Gap, Va.; Eckman, W. Va., and reports a very bright outlook.

The great traveling crane made by the Penney Iron Works, of Philadelphia, Pa., for erecting a new double track viaduct for the Chesapeake & Ohio Railroad, at Richmond, Va., has finished its work there and is to be shipped to South Africa to build bridges for the British Government.

Messrs. James Stewart & Company, of St. Louis, Mo., and Buffalo, N. Y., are reported to have secured the contracts for erecting the Manchester, Eng., plant for the Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa. It is estimated that the cost of the plant is about \$8,000,000.

The Andover Iron Company, of Phillipsburg, N. J., whose furnaces located at Belvidere, N. J., were erected first in 1848, is to be dissolved. Joseph Wharton, of Philadelphia, has purchased the entire stock of the concern and will continue the operation of the furnaces. The 3 principal stockholders in the original company were Peter Cooper, Edward Cooper and Abram S. Hewitt.

The Dickson Locomotive Works, of Scranton, Pa., has obtained a contract from Arthur Koppel, of New York City, for building 7 locomotives, which are to be utilized for plantation purposes in Java, East Indies. Richard M. Flattow, managing director of the South African end of the firm of Arthur Koppel, is now in this country placing orders for the equipment of an extension to the factory in Johannesburg.

The Pierce Well Engineering and Supply Company, of New York City, has recently obtained orders for the shipment of complete plants for artesian well boring to East London, South Africa, and Havana, Cuba. A complete oil drilling equipment has also been ordered for Trinidad, West Indies. A shipment of water-boring machinery will go forward by first outgoing steamer to Peru. The value of these orders aggregate, it is said, fully \$22,000.

One of the largest steel contracts of its kind ever awarded is being executed by Milliken Bros., of Brooklyn, N. Y., the order calling for, it is said, 16,000 tons of steel bridge work. The steel is to be utilized for a bridge of the cantilever type, 800 ft. long, across a Costa Rica gorge, for the accommodation of the Ferro Carril al Pacifico. Its height will be about twice that of the Niagara Bridge. The material weighs about 1,200 tons in bulk. The firm has also for 16,000 tons of bridge work.

Owing to the increased demand for mining machinery, the Arthur Fritsch Foundry and Machine Company, of St. Louis, Mo., has secured the services of Mr. Ferd. H. Regel, who had for the past year been the head of the Engineering Department of the mines of the Sombrerete Mining Company, at Sombrerete, Zacatecas, Mexico. Mr. Regel has interested himself financially with the Arthur Fritsch Com-

pany and takes the position of secretary and also a branch of the mining machinery department.

The Edward P. Allis Company, of Milwaukee, Wis., received from the American Steel and Wire Company a contract for a combined vertical and horizontal engine to be installed in a Cleveland plant. It will have cylinders 40 and 80 by 60 in., and a rope wheel on the shaft 23 ft. in diameter and 18 ft. face, grooved for ropes and drives for 4 different roll trains in a wire mill. Among other important orders recently booked by the Allis Company is a horizontal cross compound blowing engine for the Mountain Copper Company, of Keswick, Cal.

A special meeting of the Carborundum Company, of Niagara Falls, N. Y., will be held in Pittsburg on May 14th to readjust the finances of the company. The bonded indebtedness now is \$75,000 of 6% first mortgage bonds. It is intended to provide for this indebtedness and increase the bond issue to \$400,000. Of the new issue \$300,000 will be straight mortgage bonds bearing 5% annually and \$100,000 will be 10-year debenture bonds bearing 6% interest. The capital stock is now \$300,000 and at the same meeting it will be increased to \$600,000.

The Chicago Pneumatic Tool Company, of New York City, has been awarded a contract by S. Oshima, the director-general of the Japanese Imperial Steel Works, for furnishing 79 pneumatic tools, including chipping, caulking, riveting and drilling equipments. A number of pneumatic hoists will also be forwarded for use in the same Japanese plant. A complete pneumatic tool plant is about to be installed in the Quebec shipbuilding yards of Davie & Sons. The Chicago concern has also secured an order for a fair-sized plant, which will be used for bridge building operations at Cordova, Mexico. The air compressors will be built by the New York Air Compressor Company.

At the first annual meeting of the Tidewater Steel Company at Philadelphia on March 21st the report presented showed cash, bills receivable and material in process of manufacture, \$643,682; accounts payable, \$290,734, and that \$502,567 had been spent in improvements on the plant. The report made mention of the retirement of G. H. Stickney as president and the election of C. B. Houston in his stead. Mention was also made that the company had an arrangement on favorable terms with the Cuban Steel Ore Company. The following directors were elected: C. B. Houston, Evans R. Dick, Isaac N. Solis, Charles A. Porter, F. W. Wood, R. H. Rushton, George S. Graham, George McCall and A. S. L. Shields.

TRADE CATALOGUES.

Illustrated proposal and specification blanks for Corliss engines are sent out by the Watertown Engine Company, of Watertown, N. Y. The illustrations show clearly the general appearance of the engines and of the valve gear.

The A. Wyckoff & Son Company, of Elmira, N. Y., has just received from its printers a handsome new catalogue of its mine pipe and acid proof pipes and states that it will be pleased to forward a copy to anyone interested on application.

Messrs. Charles H. Besly & Company, of Chicago, Ill., western representatives of the Pecora machinery plants, state that flat steel color is in paste form for engines, tools and general machinery; egg shell gloss enamel finishing paint is for engines, tools and general machinery; Dresden machine enamel for radiators, gas engines, etc.; iron filler is for making rough castings smooth; Pecora blow hole cement will stand under planer, lathe, file and other finishing operations, stands 200 degrees heat and is gas and air tight. C. H. Besly's latest catalogue is ready for distribution and is mailed free to any address upon application.

The American Engineering Works, of Chicago, Ill., making and dealing in machinery and supplies for mines, mills and smelters, has issued a 23-page illustrated pamphlet describing some of its specialties. These include forged steel shoes, dies, cams, tappets and stamp mill heads; also roll shells for crushing rolls, rings, dies and roller shells for Huntington mills and wearing parts for crushers and other machinery. The company states that the special steels it uses are made by patented processes and are adapted for severe duty. The pamphlet shows the specifications to be given when ordering dies, cams and the wearing parts of rolls and crushers, and is of interest to owners of crushers and stamp mills.

The Waterbury Rope Company, of New York City, has issued another edition of its very attractive and interesting catalogue of hemp and wire rope and wire rope fittings. The catalogue, a pamphlet of 92 pages, contains a brief history of the art of rope making, a description of the manila plant and of sisal grass followed by a clear account of the modern methods of rope

making by machinery, which have replaced hand labor and the old rope walk. A chapter on rope transmission contains notes on the lubrication of manila rope, the wear of rope, directions for splicing, the proper size of pulleys, and tables for determining the size of rope for transmitting a given horse-power. In regard to wire rope, the company states that it makes the best grades of iron and steel, rolls its own rods and makes its own wire, its plant being equipped with the latest machinery. The company makes hoisting, transmission and haulage rope, galvanized wire rope, wire rigging, hawsers, etc., also a full line of sheaves, sockets, blocks, turnbuckles, etc. The pamphlet contains many useful tables and is a model of its kind.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" 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 of any kind, and shall be pleased to furnish them information, catalogues, etc.

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, and have no pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

ARIZONA.

Cochise County.

A strike of gold ore is reported in the foothills about 1 mile from Gleeson and 20 miles from Tombstone. The gold is reported to occur in a talc formation showing high values, but no definite particulars are given.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Kennedy.—A strike on the lowest level, about 2,300 ft., is reported in a cross-cut from the north drift. The ore is said to be extremely rich.

Modoc.—The 4-ft. ledge in this mine, $\frac{3}{4}$ mile east of Pioneer, is estimated to average over \$25 per ton. T. Schenck is working the property under bond.

Butte County.

(From Our Special Correspondent.)

Continental Dredger.—This dredger on Feather River near Oroville is reported to have cleaned up over \$30,000 in a single week.

Contra Costa County.

(From Our Special Correspondent.)

Peyton Chemical Company.—This company has been incorporated with a capital stock of \$650,000. The incorporators are W. J. Barnett, O. K. McMurray, T. H. Nicholls, A. G. Booth and Marcel E. Cerf. A plant is in course of erection 2 miles from Martinez.

El Dorado County.

(From Our Special Correspondent.)

Bernard Cinnabar Mining Company.—This company has been organized to reopen the Old Amador quicksilver mine between Shingle Springs and Latrobe. The mine was abandoned over 25 years ago, the old workings consisting of a 240-ft. tunnel and an 80-ft. shaft in the tunnel. The vein, about 2 ft. wide, is said to be rich in cinnabar.

Kern County.

(From Our Special Correspondent.)

Johannesburg Reduction Works.—Changes are being made to substitute oil fuel for wood and coal. Two tanks having a capacity of 3,500 gals. each have been placed on the hill back of the mill.

Yellow Aster.—A new ore body in a soft formation, assaying \$125 per ton, has been discovered at this mine in the Randsburg District. The new 100-stamp mill is now ready to receive ore at the rate of 600 tons per day. The working force has been increased.

Nevada County.

(From Our Special Correspondent.)

It is reported that the Lithgow Brothers, of the State of Washington, have purchased several placer claims at Brandy Flat and will start work at once.

W. H. Dobson, of New Zealand, and D. W. Balch, of San Francisco, are in Penn Valley arranging to test 2,400 acres of gold-bearing ground which has been bonded by a large dredging company organized by New Zealand men.

North Star.—At this mine, 2 miles south of Grass Valley, the ledge has been struck in the Central shaft at a vertical depth of 1,600 ft. This makes the property the largest mining proposition in the country. Work has been in progress for 4 years and a great deal of money has been spent.

Reddik Mining Company.—The stockholders of

this company have elected F. G. Beatty and J. H. Coughlin directors to fill the vacancies caused by the deaths of W. E. Brown and Geo. Fletcher. Charles P. Loughridge has been elected vice-president and F. G. Beatty secretary. The property is located on Selby Hill, north of Nevada City.

Riverside County.

(From Our Special Correspondent.)

Golden Eagle.—A wagon road has been constructed from the county road to the foot of the mountain, where a trail leads to the mine at an elevation of 500 ft. Down this trail the ore will be brought on sleds. Some 15 tons of ore have already been shipped to the smelter for a test run. Messrs. Hyatt & White are owners.

O. K.—About 12 tons of ore averaging \$20 per ton are milled daily at this mine in the Virginia Dale District, 50 miles northeast of Walters Station. If the pipe line to convey water proves satisfactory the Brooklyn, Supply and Ivanhoe will resume work.

San Bernardino County.

(From Our Special Correspondent.)

It is reported that a Los Angeles syndicate has located 1,250 acres of salt marsh about 25 miles southeast of Danby and is preparing to start work on a large scale. This salt deposit is very extensive, and was formerly worked by the Crystal Salt Company.

It is reported that D. P. Doak, of Kansas City and St. Louis, will erect a 60-ton smelter in the Pass adjacent to the State Line Pass, between Ivanpah and Mesquite Springs. His intention is to treat copper ores from the Tecopah, Resting Springs and Polomac mines, which he controls. As custom ore will be taken this smelter will be of great benefit to mine owners in the vicinity.

Columbia.—The old mill on these claims in the Gold Belt District has been replaced by a new 10-stamp mill. On the dump are 500 tons of ore which will be concentrated.

Shasta County.

(From Our Special Correspondent.)

Several farms along Clear Creek have been bonded and drillers have been at work several weeks testing the ground. The tests are said to be satisfactory.

The Redding Electric Light Company and the Redding Water Company have been absorbed by the Keswick Electric Power Company, which is building a plant on Mill Creek, near Shingle-town. Price said to be \$60,000. It is the intention of this company to send power as far north as Copely and as far south as Corning. The plant is to be completed by July 1st. Lines are being run to Redding, Keswick, Copper City and the large mines; also to Red Bluff, Tehama and Corning.

Cardiff.—This group of 7 claims in Centerville District has been bonded by O. Westbrook to F. M. Archer and associates for \$40,000. There is a 500-ft. tunnel in the mine, which is to be extended 400 ft. further. The 10-ft. ledge of free milling ore is said to be fair grade.

Mountain Copper Company, Limited.—This company has placed an order with the Edward P. Allis Company, of Milwaukee, through their Spokane office, to furnish and erect at Keswick, Cal., machinery for a copper converting plant, consisting of three stands of converters, blowing engine, electric crane and all the necessary appurtenances belonging to a converting plant. It is expected that the plant will be in operation in about six months. The total shipping weight of the machinery is approximately 500,000 lbs.

Sierra County.

(From Our Special Correspondent.)

Thistle Shaft.—The management is preparing to run an 8-ft. tunnel 2 miles to drain its ground, which will probably require 2 years to complete. A large force will be worked. The water season in this vicinity has been the best in years.

Siskiyou County.

(From Our Special Correspondent.)

Cherry Hill.—The mill at this quartz mine on Cherry Creek is running steadily on ore taken out during the fall and winter. New ore is being blocked out.

Commodore.—This mine at the head of Barkhouse Creek is still producing good ore, although the working force are obliged to carefully avoid accidents in way of caves and slides.

Tuolumne County.

(From Our Special Correspondent.)

Black Oak.—The main shaft is down 950 ft. and drifts have been run north and south on the several levels. The ore body, from 6 to 10 ft. wide, is high grade. The new ore shoot on the lowest level is 350 ft. long south of the shaft. It was first discovered 200 ft. from the bottom of the shaft. The mill with its additional 10 stamps is ready to start up with 4 concentrators. The plant can either be worked by steam or water. The company also operates a cyanide plant. A $\frac{1}{2}$ -kw. electric generator has been put in and mine and buildings are now lighted by electricity. About 125 men are employed.

Dunsmore.—Work is progressing rapidly on the new mill and cyanide plant. The old shaft has been tapped in an upraise from the lower tunnel. About 700 ft. of backs have been gained, and the shaft and tunnel connected, draining the mine.

Harvard.—The water in this mine is below the 500 ft. and there is some 200 ft. still to be pumped out. The new oil tank is in position and the Hammel oil burners are being put in and connections made. Several other mines are being equipped with these burners.

Mount Hood.—The shaft is down 145 ft. and the cross-cut is said to show a 34-ft. ledge of blue-white quartz milling \$20 per ton. The claim is near the Rawhide Mine. J. H. Burkhart is superintendent.

Prudhomme.—The plant, consisting of a 5-stamp mill, with automatic feeder and 2 concentrators, is ready for crushing. A number of buildings have been completed and the shaft has been sunk to 140 ft. It will be sunk 100 ft. further. The south drift has been run 100 ft. on the vein. The working force is to be increased. This property is near Astraville.

Willietta.—A water power plant is to be installed at this mine 1 mile southeast of Jacksonville.

COLORADO.

Clear Creek County.

(From Our Special Correspondent.)

Big Five.—Contracts have been let for machinery for the tunnel started by this company to cut lodes lying north of Idaho Springs toward Central City. The machinery is to be in place in 6 weeks. Electric drills are to be used. The company has bought one mile of land and water rights along Clear Creek.

Centennial.—A deal is under way with Boston capital for the purchase of this mine at Georgetown. The option is for \$65,000.

Colorado-California Shareholding and Mining Company.—Parties operating the 3 mines and 2 mills under this name have become associated with others here and organized the Seaton Mountain Company for supplying electricity for lighting and power. The Idaho Springs lighting plant has been acquired. Two electric plants will be operated—one with steam and the other with water. Mines and mills in both Gilpin and Clear Creek counties are to have electric power.

Consolidated Stanley Mining Company.—There are no new developments and the mine is still idle. Two factions are trying to take control away from the temporary receiver.

John Owen Mining and Milling Company.—A change in the management has been made, John Owen retiring and being succeeded by George Riley. Drifting on the ore is under way at the Freighters' shaft. Unwatering of the Aduddell Mine continues and a drift is being extended on the Veto Mine through the Newhouse Tunnel. The company has plans for the erection of a large concentrating mill to handle the thousands of tons of mineral now broken and lying on the stopes. Lombard Williams, president, and Charles Brewer, secretary, of Boston, are visiting the property.

Massachusetts Mining Company.—This company, owner of the Freeland Extension Mine, has been carrying forward development. The shaft has been sunk to about 700 ft. and 4 levels are being driven in a smelting ore. The values are satisfactory and the mine is paying dividends. W. A. Haggott is manager.

Morning Star.—This vein has just been cut in the Newhouse Tunnel at a depth of 1,900 ft. and in the tunnel 10,100 ft. Manager Hanchett considers it the best-looking vein so far cut by the big bore. The values are low where cut. The mine is owned in Boston, the company having made contracts some time ago with Newhouse for working the vein in the tunnel as soon as cut.

Custer County.

Terrible.—This mine at Isle is once more in operation, with a small force. The Franklin, in the same locality, belonging to Cripple Creek men, is to be developed with a 300-ft. shaft, work having already been commenced.

Fremont County.

The strike of coal miners of this county has been ended by an agreement satisfactory to both sides, and work will be resumed April 1st. About 1,500 men are affected.

Gilpin County.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—E. R. Trafford to W. H. Myers et al., the Portia placer claim, situated in Central District; R. A. Moody to C. F. Erwin, $\frac{1}{4}$ interest in Yellow Gold, Thea H. and Sampson Lodes in Independent District; T. Kelley et al. to Ed. Berg, the Semprone Lode in Pine District; E. V. Thompson, Jr., to R. C. Miller, lease and option for 3 years in sum of \$15,000 on the Treasury Lode in Gregory District.

Calumet Gold Mining and Milling Company.—Some fine-looking peacock ore has been opened up in the 7th level. The daily shipments average

40 tons, mostly fair grade concentrating ores. J. Clayton, Idaho Springs, is manager.

Defiance.—Southern parties are reported to have purchased this property in Russell District, consideration named as \$100,000. Machinery is to be installed and new buildings erected, possibly a mill. J. P. Adams, of New Orleans, La., examined the property.

Gregory-Bobtail.—Leasers working in ground from the cross-cut to the Fisk and Cook lodes took out 4 cords of ore, which run 84 oz. gold or 21 oz. per cord. This is the highest grade mill dirt taken out in this county for some time.

Hillhouse.—Eastern men have ordered an air compressor for this property on which they will start work.

Independent District.—There are several mines doing especially well. The Perigo employs 50 men and is producing from 75 to 90 tons of ore per day, under the management of E. M. Mes-siter, of the Tonawanda Leasing and Mining Company. Some ore from the upper workings taken out by leasers ran 12 oz. gold per cord. Markwell & Stuart are shipping mill ore from the Dirigo, running 4 to 6 oz. gold per cord at Black Hawk Mills. The Gold Dirt is shipping from 20 to 25 tons of mill ore daily and the Golden Flint lessees are taking out ore which is worth about 4 oz. gold per cord, including tailings.

Missouri.—Canadian parties have taken a lease and bond on this mine in Russell District. Henry Paul, of Central City, is owner.

Placer Mining.—The Gold Coin and Gold Bullion placers on North Clear Creek below Black Hawk are to be started up before the end of this month. Last year a large amount of preparatory work in building flumes and dams and laying pipes was accomplished, the actual work of mining being stopped early on account of shortage of water; but what was done showed very encouraging results. Ohio parties are interested and the creek will be worked by hydraulics. Harry J. Sears, Central City, Colo., is manager.

Scandia.—A 50-H.-P. hoisting plant from the Mine and Smelter Supply Company, of Denver, is being installed and a larger boiler will be put up later. The property is being worked by C. P. Collins, of Bradford, Pa., under superintendency of M. Weisbeck, of Nevada.

Town Topics Mining Company.—Ore from the 3d level ran \$128 per ton. The company is carrying on extensive developments and will make heavier shipments from its East Notaway mine. M. D. Draper, Central City, is manager.

Lake County—Leadville.

(From Our Special Correspondent.)

Ore Production.—The average is now 2,600 tons a day of all classes of ore. The A. M. W., Penn, Small Hopes, Caribou and a number of smaller leasers have added materially to their regular shipments.

Acacia.—This new project in Empire Gulch has found some gold quartz which assays well. Some fair iron has also been encountered, but none of the finds is large.

A. M. W. Mining Company.—Shipments have increased to 150 tons a day. Much satisfactory development work is being done on the great masses of low-grade sulphides. The new mill is running full capacity making a good zinc concentrate, which is shipped to Europe.

Cloud City Mining Company.—This new shaft at Third and Hemlock Streets has at 250 ft. encountered porphyry. There is no trouble with water.

First National.—The new lessees are now shipping about 500 tons a month of good lead sulphide.

Long & Derry Mining Company.—At a meeting of the stockholders to arrange for a settlement of indebtedness matters were satisfactorily adjusted.

Midas.—Shipments keep steady at 200 tons a day of very good iron ore.

Mike & Starr.—Some important new work is planned by Mr. Jack McAllister, who is operating this lease. He is shipping 30 tons daily from the old workings to the Morley Smelter at Buena Vista.

Nayn Mining Company.—On Iron Hill the sinking of the old White Cap shaft to the lower contacts is progressing and the shaft is down 550 ft. Two drifts are being run at the 500 ft.

New Elkhorn Mining Company.—W. S. Kelly represents the London owners, who recently decided to start work on the Elkhorn, Fitzhugh and other territory amounting to 75 acres at the mouth of Evans Gulch. The water in the Plummer shaft is being lowered and at 445 ft. a 1,000 gal. station pump is to be installed. Drifts are to be run out at the 340-ft. level. The company has a fine plant of machinery. Work will be carried out on an extensive scale.

New Leadville Home Mining Company.—About 250 tons a day of iron is being hoisted. Sinking continues on the Bon Air and Alice shafts and the Bon Air is handling considerable water. The Alice has struck lime a little below 400 ft.

Nisi Prius Mining and Leasing Company.—Mr. Sullivan is pushing work on both shafts of the Nisi Prius. The new shaft is down 750 ft., where prospecting work is so far without results.

Penn Mining Company.—About 150 tons a day are shipped and important development is being done from Nos. 2 and 3 shafts. At No. 1 a diamond drill is to test the lower contacts.

Sedalia.—There is every possibility that this gold belt property will soon again become a producer. Large bodies of low-grade ore are exposed and at the 725-ft. level indications are most favorable.

Tarshish Mining and Leasing Company.—This is a 3 years' lease on 8 acres of the Seneca ground, where a deep shaft was sunk. The shaft is over 600 ft. deep and in a 65-ft. drift a 4-ft. vein of good copper, silver-lead ore is being opened which will average \$100 to the ton.

San Juan County.

Elizabeth Mining Company.—This company is operating the Silver Link-Elizabeth properties in Poughkeepsie Gulch and has 8 car-loads of good ore broken and awaiting shipment.

Excelsior.—Work on this long cross-cut on Cement Creek is to be resumed at once and pushed until the lead is cut, 1,500 ft. from the adit and 800 ft. below surface. A shaft has also been sunk 100 ft. on a vein of heavy galena and carbonates.

Fleece Mining Company.—This company is operating the Golden Fleece property on lease and bond. A shaft, now down 200 ft., is being sunk, and a streak of rich ore helps to pay operating expenses. Large bodies of low-grade ore are also being blocked out.

Hercules Mining and Milling Company.—This company has been repairing its big mill on Sultan Mountain, near Silverton, by adding new machinery. The mill will start in a short time, as there is a sufficient supply of water. The concentrates will be shipped to the Kendrick-Gelder Smelter. The power plant furnishes power for the air compressor and all development is done with air drilling. This company will give employment to about 100 men.

Three Brothers.—This claim, located in Poughkeepsie Gulch, 12 miles north of Silverton, in the Uncompahgne District, will be worked this summer under bond and lease. This property in the '70s shipped ore to the old Green Smelter and returned nearly 20 oz. in silver and some good gold values.

San Miguel County.

(From Our Special Correspondent.)

Recent changes in ownership and the organization of new companies indicates that the present year will be one of unusual activity in local mining circles.

Ore shipments of concentrates from the Telluride Station last week were 41 cars, saved from the tailings of 2,400 tons of crude. In addition to this about 3,000 oz. of gold retorts were shipped out by express. A large increase over last year's output is expected.

Alta.—This mine is shipping 1 car per week of first-class ore that nets \$700 per car, besides piling up about 6 times that amount of second-class for milling, with but 8 men working. The development will not exceed 6,000 ft. A remarkable showing the writer has not seen during 20 years. N. T. Mansfield, of Telluride, is manager.

Butterfly-Terrible.—Since January 1st this company is said to have earned more than enough to increase its quarterly dividend. Stock placed last summer at 19c. is now selling at 39 $\frac{1}{2}$ c. D. J. Sayer, of Ames, is manager.

Keystone Hydraulic Mining Company.—This company, incorporated with \$5,000,000 capital in \$100 shares, proposes to mine and mill ores generally and work the Keystone Placers, which include between 600 and 700 acres of gravel on both sides of the San Miguel River from 3 to 5 miles below Telluride. These deposits have been worked in past years, showing gold ranging, it is alleged, from 10c. to 75c. per yd. A flume 7 by 12 ft. and 5,000 ft. long will be constructed, pipe lines laid, hydraulic giants set up and buildings erected. Many men will be employed. E. L. Davis, of Telluride, is resident manager.

Smuggler-Union.—This mine recently added to its large holdings the Contention Group of 7 gold-bearing claims and mill site on Bear Creek. The ground in the past 15 years has been opened by levels, upraises, etc., and considerable ore milled from this development has yielded \$12 per ton by amalgamation. Arthur L. Collins, of Telluride, resident manager, is now excavating for the foundation of a 40-stamp addition to one of the 2 60-stamp mills at Pandora. When this is completed the company will be able to crush 500 tons of ore per day. An aerial gravity tramway will connect the Contention workings with the mill.

Tomboy Gold Mines Company.—This company has contracted with the Telluride Iron Works for an aerial tramway from the Argentine level to the Columbia-Menona Mill, a distance of 800 ft. The 40-stamp mill has a capacity of 100 tons

per day and the Tomboy Mill 200 tons per day. Rumors say that the company has purchased the Columbia-Menona Mines and Mill, but until Manager John Herron, of Telluride, returns from London this will not be definitely known. The indications are that the rumors are correct.

IDAHO.

Idaho County.

Blue Jacket.—Finch & Campbell, of Spokane, Wash., have made a second payment on this property at Crooks Corral, being 1/3 of the \$11,500 called for by the option. The new hoist is working well. A drift is being run at the 200 ft. on a 10-ft. vein of chalcopryrite. About 20 men are at work.

Corson & Thompson.—This claim on Salmon River in Crooks Corral District is reported to show a ledge 20 ft. wide carrying \$20 gold and 15% copper.

Oro Fino Quartz Mining and Milling Company.—This company, owning property in the Pierce District, is incorporated under the laws of the State of Washington, with headquarters at Walla Walla. Its property is to be turned over to a new company, the Klondyke Mining and Milling Company, having as officers John Bach-told, president; Albert Niebergall, secretary and treasurer, and C. T. Nelson, of Valley Grove, superintendent and manager. The company has a stamp mill on the ground which will be put up as soon as the weather permits.

Owyhee County.

Cumberland.—This mine on War Eagle Mountain near Silver City is owned by the Virtue Consolidated Mines Company, of Montreal, Quebec, of which A. F. Gault is president. Arthur Buck-ber is resident director. The vein worked is small and the country rock is a very hard granite. The ore, however, is rich and free milling. Machine drills are used both for development and stopping. The mine is worked through a shaft having 2 compartments 4 by 4 ft., with self-dumping skip. The gallow frame, 56 ft. high, contains the ore and waste bins and a sorting floor. A covered tram connects the ore bins in the shaft house with the crushing floor of the mill 200 ft. away. Here is located the big Comet ore crusher and a battery of 10 1,000-lb. stamps. From the battery the pulp runs over silver plates to the settling vats, from thence to the grinding pans and settlers.

Steam is generated by 3 Woods tube boilers of 100 H.-P. each. The mill is driven with a compound Corliss engine. In the engine room is also located a cross-compound 2 stage Reidler air compressor, having a capacity of 12 drills. It also furnishes power to operate the pumps throughout the mine and to provide the mill with water. The hoist is DeBeers pattern, cross-compound direct acting, built by Fraser & Chalmers, of Chicago. It has a capacity of lifting 5 tons 2,000 ft. per minute.

Just below the mill is located the retort room and assay room. The floor of the entire building is of concrete. Adjoining the assay office is the draughting room and the chemical laboratory.

About 60 men are employed at the mine and mill. J. X. McGhan is general foreman and Roy Handy assayer.

ILLINOIS.

A dispatch of March 22d from Springfield, Ill., says: "It has developed that the Harriman syndicate, controlling the Chicago & Alton and Illinois Central Railroad systems is back of the movement to consolidate the coal mining properties of Illinois into a \$75,000,000 combine. The capitalists of this syndicate will lend their financial support to the consolidation project and will hold a majority of the stock in the enterprise. The authority for connecting the Harriman syndicate with this latest industrial movement is an official of the Chicago & Alton Railroad."

IOWA.

Coal Miners' Wages.—The scale, as ratified by the coal operators and miners, at Ottumwa, for the ensuing year, from April 1st, is as follows:

"Per ton of 2,000 lbs., at the option of the operators as to mine-run or lump coal, provided that only such coal as is sold as mine-run shall be paid for on that basis, unless otherwise agreed upon between the state board of United Mine Workers of America and the operator of the mine.

"Screen lump coal, per ton, 95c.; 80-ft. entry, per yard, \$1.53; 12-ft. entry, per yard, \$1.20; 14-ft. entry or over, per yard, \$1.15; room turning 12 to 14-ft. doorway, each, \$2; room turning 27-ft. doorway, two men, \$2; double shifting entries, 25c. per yard extra; machine loading in Mystic field, per ton, 50c.; machine loading in Centerville field, per ton, 44c.; machine loading at Shawville, Jeffrey machine, per ton, 47c.; machine runners, Mystic field, same as last year; machine runners, Centerville field, same as last year; machine runners, Shawville, per day, \$2.50; machine shovelers, Shawville, per day, \$2.25; drivers and pushers, per day, \$2; track layers and pipe men, per day, \$2.15; cagers, \$2; oilers and trappers, per day, \$1; general inside, adult labor, per day, \$2. Boy drivers may be used between partings, but when used at regular

switching they shall be considered as men and receive men's wages. Miners taken from the face to do day work, \$2.15."

MARYLAND.

Allegany.

Sinclair Mining Company.—John J. G. Coyne, of Baltimore, representing Eastern men, has purchased the plant of this company at Barton from Malcolm Sinclair for \$25,000. The plant is the only one in the George's Creek region in which machine mining prevails, and it has been idle several months. The purchasers expect to employ about 100 men.

MICHIGAN.

Iron—Gogebic Range.

Odanah Mining Company.—The properties of this company, the Carey and Superior mines, located west of Hurley, Wis., have been sold to Pickands, Mather & Company, of Cleveland, O. These mines have been operated about 2 years, producing last year 140,000 tons of ore, which may reach 175,000 tons this year.

Iron—Menominee Range.

Corrigan McKinney & Company.—This company is now working the Great Western, Armenia and Crystal Falls Mines near Crystal Falls. W. J. Richards is local superintendent.

Hilltop.—The American Mining Company has started work for the season at this mine near Crystal Falls.

Murphy.—This property in Stambaugh Township has been renamed the Baltic and will be worked by the Verona Iron Company, with C. E. Lawrence as superintendent. A spur of the Chicago & Northwestern track will be run to the mine from Platka this spring.

Pewabic.—This Iron Mountain mine has placed an order with the Fred M. Prescott Steam Pump Works, of Milwaukee, Wis., for a new pumping plant for the Walpole Mine. The plant will have a capacity for handling 1,000 gals. of water per minute, from a depth of 800 ft.

Vivian.—This property adjoins the old Quinnesec Mine at Quinnesec and is known to carry the extension of the ore body recently found on the Quinnesec. It will be worked by the Verona Iron Company, of Pickands, Mather & Company, with Chas. E. Lawrence superintendent.

MINNESOTA.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Iron ore hauling on the Duluth & Iron Range road will start about April 1st, in small quantity. The station at Mesaba will be opened about April 5th, and the weighing offices at Biwabik before that. Shipments will be much larger than ever before and the road is preparing for 5,000,000 tons, an increase of 20% over last year. The Duluth, Missabe & Northern will not begin probably before April 15th. It will also exceed very materially the business of 1900.

Arcturus Mining Company.—It is understood that a long time option is now being negotiated at \$400,000 to Duluth parties and that they will at once explore the land. The Arcturus Iron Company explored the property a number of years ago, but their work showed a very mediocre deposit. This and the poor showings made at Buckeye and Diamond, close by, gave that part of the Mesabi a black eye—i.e., new option holders know how to explore and are confident that they have a good body of ore. The former Arcturus explorations cost about \$15,000 and were money thrown away.

The Eastern Minnesota is exploring in the vicinity of the above properties and will examine the location thoroughly.

Buckeye Mining Company.—This mine is under option to an old range interest and diamond drills will be put in at once. It is expected that drilling will show a considerable body of ore, though what has been proved heretofore has not been of the best quality. The Buckeye is in T. 56, R. 24.

Columbia Iron Company.—Capt. Wm. White, of the Spruce, has taken charge. New and large boilers have been installed, the mine unwatered and the work of opening it is being pushed. This mine is in the village limits of Virginia, and was formerly controlled by the A. E. Humphrey interests.

Diamond.—This property, near the Buckeye, has been bought by C. A. Congdon and other interests usually affiliated with the Oliver Iron Mining Company, at a price under \$200,000. It was explored years ago and found to contain mixed ore with sand and jasper, a poor showing. Recent developments have shown a different state of things, and the mine is said to be a good purchase.

Fayal Iron Company.—This mine has the largest stockpiles it ever had. The stripping contractors are preparing to begin next week. There is fully 5 ft. of frost and the work will be difficult for some time, but it is imperatively demanded. Fayal is liable to ship this year considerably more than the 1,250,000 tons of 1900.

Genoa Iron Company.—This mine will begin lake shipments about April 5th. It is working

2 shafts and will mine more ore than last year.

Explorations are under way in the center of T. 58, R. 19, and drills have penetrated mixed ore indicative of the probable presence of a body of ore beneath. These works are on a 20c. lease. Several State leases nearby are under negotiation for sale.

Itasca Mining Company.—The mine in section 20, T. 58, R. 19, which was explored by J. T. Jones and associates some time ago and found to contain about 10,000,000 tons of a good non-Bessemer ore, has been sold to P. L. Kimberley for \$68,000. The property is a 25c. lease and this bonus covers the exploration costs and a moderate profit to the Jones party. The lease is one of the very few State leases that have shown ore, for the State has now one of the more important properties, when quality and quantity are considered. It has only one Bessemer mine and that one is small. The Itasca will probably land with the Republic Iron and Steel Company. It will be an easy mining proposition.

Mahoning Ore Company.—The stripping contractors are beginning work. They will move about 300,000 yd. this year. The mine will ship nearly 1,000,000 tons, possibly more.

Roberts Iron Company.—This mine will begin shipments about April 15th, and will send out more ore than last year. It has about 50,000 tons in stock.

Sparta Mining Company.—This mine has begun all-rail shipments to the Ashland furnace, which has been closed down a large part of the winter. The mine will ship to lake in about 2 weeks.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The price for the best grades of zinc ore last week was \$27 per ton and several large lots sold at this figure, including the ore from the Eagle and Owl Mines at Belleville and that from several Joplin mines. Lead sold at \$23.50 March 23d, but to that date the price was \$23.25. Following is the turn-in by camps of the Joplin District for the week ending March 23d:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,553,230	382,620	\$41,988
Galena-Empire	1,587,670	211,930	23,969
Carterville	1,850,660	247,080	26,301
Webb City	494,480	66,500	11,992
Oronogo	773,130	17,470	9,975
Aurora	765,460	23,420	8,129
Granby	356,000	27,000	4,075
Zincite	644,150	6,400	8,523
Neck City	514,880	6,460	7,103
Central City	220,380	13,940	2,974
Cave Springs	160,230	7,680	2,101
Roaring Springs	133,630	3,080	1,538
Spurgeon	150,760	30,850	2,325
Peacock City	100,960	5,760	1,586
Alba	145,090	.....	1,586
Duenweg	51,510	98,710	2,764
Stotts City	62,520	24,540	1,403
Carthage	59,800	.....	718
Ash Grove	63,120	.....	1,452
Spring City	11,020	51,060	1,308
District total	10,699,150	1,222,800	\$161,620
Total, 12 weeks	116,375,720	15,358,090	\$1,113,208

Zinc value for week, \$133,006; lead value, \$28,614; zinc value 12 weeks, \$1,381,096; lead value, \$349,310.

During the corresponding week last year the best grade of zinc ore sold for \$32 per ton and lead at \$27.25 per 1,000 lbs.; the sales were less than this year by 617,400 lbs. of zinc and 148,070 lbs. of lead, and the value greater by \$5,837. For the first 12 weeks last year the sales were less by 654,220 lbs. of zinc and 2,969,590 lbs. of lead and the value greater by \$302,327. Compared with the previous week, the zinc sales were greater by 17,540 lbs., the lead sales less by 778,160 and the value less by \$13,576.

G. Whalen Beach, Dyke V. Keedy and H. J. Froelich, of Boston, are in the city claiming to represent the Imperial Zinc Smelting, Refining and Manufacturing Company, of Boston, and proposing to expend \$500,000 in building zinc smelters, rolling mills and producing shingles and other forms of manufactured zinc products if the citizens will donate the grounds for the buildings, and wealthy citizens headed by Chas. Schifferdecker, O. H. Picher, of the Picher Lead Company, Capt. E. O. Bartlett and others apparently have faith in the proposition and are securing options on land for the purpose. Beach claims to be a practical smelter man of life-long experience and says that recently the works of the Jersey City Zinc Smelting Company were turned over to him for experimental purposes.

MONTANA.

Madison County.

Red Chief Mining Company.—This company is working the Red Chief and Water Lode mines about 1 mile above Red Bluff. About 20 men are busy. In connection with the mine the company is operating a Merrill mill of 20 tons capacity and has 14 men at work. The ore from the mine, after passing through a Wheeler crusher, a combination of rolls and a jaw crusher, passes by gravity to the ore bin, and thence through a Challenge automatic feeder into the mortar. Revolving inside are 3 mullers

resting upon strong springs which can be regulated as needed. The screen surface covers 18 ft., or the entire circumference of the mortar for about 18 in. from the base, and the pulp after being splashed through a 40-mesh screen, crosses 2 sets of plates and over 2 Wilfley tables.

Revenue.—This mine at Richmond flats has 20 men at work. The mangement has been prospecting the mine for nearly a year. The mill is situated in the flat about 1 mile from the mine, and the ore is transported in wagons.

NEVADA.

Humboldt County.

(From Our Special Correspondent.)

Granite Creek Smelting and Refining Company.—The Colossus Development Company has conveyed to this company the Emerald, Klondyke, Boa Constrictor, Mountain Granite, Turinese, Genoa, Blue, La Grande, Comet and Sunside mining claims, located near Granite Creek. The consideration is said to be \$2,000,000.

Storey County—Comstock Lode.

Chollar Mining Company.—At the meeting on March 20th about 109,000 shares of the 112,000 shares of capital stock were represented. The following directors were elected for the ensuing year: H. B. Goodwin, Thomas Cole, Charles Hirschfeld, Herman Zadig and E. P. Barrett. H. B. Goodwin was elected president; Thomas Cole, vice-president; Charles E. Elliot, secretary, and H. M. Gorham, superintendent.

NEW YORK.

Clinton County.

Iron Mining.—At Mineville, on the Lake Champlain & Moriah Railroad the day shift in the Bonanza shaft was recently increased, and a night shift will soon be put on. At the new Harmony shaft much progress on a shaft, 6 by 18 ft., to allow a double hoist and a space for water and air pipes. The shaft has passed through a small vein of ore and entered the rich 23-ft. vein found by drilling. The railroad spur has been extended a quarter of a mile to take ore from the Harmony.

OREGON.

Josephine County.

A rich find of gold-bearing quartz is reported on Josephine Creek at Kerby, 30 miles south of Grant's Pass. The ledge is reported to be from 5 to 10 ft. wide. The discovery was made by Geo. Bour and Thomas Johnson. The claim is owned by David Bour and E. Daly.

Umatilla County.

Independence Mining and Milling Company.—This company, with \$2,000,000 capital, has been organized at Pendleton by C. E. Dugger, W. H. and J. D. Williams and E. A. Burns to work a group of claims at Mountain Home, 28 miles south of Pendleton.

PENNSYLVANIA.

Anthracite Coal.

Pennsylvania Coal Company.—Complete control of this company has passed to the Erie Railroad Company through a reorganization of the company's executive staff. New officers were elected as follows: President, G. M. Cumming; vice-president, L. S. Miller; vice-president and secretary, J. A. Middleton; auditor, J. T. Wann; treasurer, J. W. Platten. The last-named is the only one of the Pennsylvania Coal Company's officers who was re-elected. President Cumming is now first vice-president of the Erie and Mr. Miller is assistant to the Erie's president.

The company is preparing to rebuild its No. 14 breaker, recently burnt. The old breaker had a capacity of 1,500 tons of coal daily. The new one will have a capacity of 3,000 tons. The company may sink a new shaft to the east of the new breaker to lap the Red Ash Vein at a depth of 550 ft.

Philadelphia & Reading Coal and Iron Company.—This company's statement for February and the eight months of the fiscal year from July 1st to February 28th is as follows:

	February.	Year.
Earnings	\$2,337,610	\$19,086,361
Expenses	2,165,910	17,583,262
	\$171,700	\$1,503,099

For the eight months the gross earnings decreased \$1,492,028, or 7.2%, and the expenses \$1,206,913, or 6.6%; leaving a decrease of \$285,115, or 15.9%, in net earnings.

Bituminous Coal.

Gates.—An explosion of gas in this mine of the Eureka Fuel Company in the Klondyke Field in Fayette County on March 25th 16 men were badly burned. Robert Nelson, the mine foreman, and 4 other men were either killed or probably fatally injured.

(From an Occasional Correspondent.)

Cobaugh.—This and other tracts of coal land containing 2,200 acres in the Wilmore Basin synclinal near Somerset, 2 miles from the Listie Mine, has been leased by Harry W. Althouse, of Pottsville, Pa. The Baltimore & Ohio Railway passes through the property for 2 miles. A diamond drill has proved the Upper Freeport or

Coke Yard bed, the Lower Freeport or Mossbanon bed and the Upper Kittanning or Listie bed of normal thickness and excellent quality, the latter coal having no refuse, while that of the former has 2 in. of slate. Capital is being interested to develop the property on a large scale.

SOUTH DAKOTA.

Lawrence County.

(From Our Special Correspondent.)

Belt Development Company.—All of the machinery has been installed at this company's hoisting plant at Kirk, and it may start by April 1st. O. B. Amsden has charge. The officers are: W. F. Crosby, president; G. A. Warth, vice-president; L. H. Ehrich, secretary, all of Colorado Springs, Colo. The other directors are: P. A. Gushurst, Lead; J. D. Herring, J. B. Kimsey and G. R. Jewett, of Colorado Springs. The company has 500 acres of ground. Some of the stock has been sold in Boston and New York. The company is capitalized at 200,000 shares of stock, par value \$1.

Ben Hur.—John Hurley and Andy Garrett, of Terry, are taking out ore from this claim in Nevada Gulch, on a lease.

Custer Peak Mining Company.—This new company has started work on a block of 400 acres of ground near Custer's peak. The officers are: President, J. S. Blackwelder; vice-president, John Wise; secretary, H. Walter; treasurer, Wm. M. Wheatley; general manager, John O'Brien, all of Lead and Deadwood. The company will erect a mill.

Deadwood-Bear Gulch Company.—O. H. Stromsness, of Deadwood, has been making plans for a 50-ton cyanide plant for this company, in Bear Gulch District. A steam hoist will be shipped April 1st. The company is composed of Peoria and Chicago men.

Galena Mining and Smelting Company.—The tunnel in the Hoodoo Mine is now in about 1,425 ft., the Eureka Tunnel 900 ft., and the Union Hill Tunnel about 250 ft. George Griggs is superintendent.

Golden Crest.—Charles Graham, of Deadwood, is shipping ore on a lease, from the Golden Crest Mine, in upper Spruce Gulch.

Hidden Fortune Mining Company.—This company has been organized by Denver men. The officers are: President, A. M. Stevenson, Denver; vice-president and general manager, George M. Nix, Deadwood; secretary, George D. Begole, Denver; treasurer, Wallace T. Perkins, Denver; H. S. Shaw, Josiah Winchester and H. J. Mayham. The company has announced that it will erect a 200-stamp mill and cyanide annex at Belle Fourche and install a hoisting plant. Coal will be brought 25 miles from the Hay Creek coal mines.

Horseshoe Company.—A steam hoist has been set up on Iron Creek on this company's property, to sinking to lower quartzite. The company owns over 3,000 acres of ground.

Spanish R.—An air compressor and other machinery have been placed in this mine, in Carbonate District.

Spearfish Mining Company.—The third clean-up has been made by this company at the 200-ton cyanide plant, at Ragged Top.

Texarkana.—A 15-in. vertical of rich ore is reported in this claim in Dead Dog Hill District, south of the Red Cloud Mine, which has been bonded by Des Moines people.

Twentieth Century Mining Company.—This company reports a large shoot of lime ore on its property in Ragged Top District. The company intends to erect a cyanide plant. The officers are: President, M. E. Pinney; vice-president, J. M. Fish; secretary, A. W. Coe; superintendent, O. N. Brown, all of Deadwood.

Uncle Sam.—The articles of agreement between Dr. Franklin R. Carpenter and the Clover Leaf Mining Company have been filed. The company was to make \$2,000 first payment on the Uncle Sam Mine. The second payment was to be \$8,000 and the balance, or \$45,000, was to be paid at the rate of 25% of the gross yield of the ore in the mine. The company is now dropping 20 of the 60 stamps of the mill.

Pennington County.

(From Our Special Correspondent.)

Elizabeth Mining Company.—This company has purchased the mining ground belonging to Fred Cross for a reported consideration of \$20,000. The ground joins the Bismarck Mine on the southwest.

Mono-Metallic Company.—John Wise, of Deadwood, general manager of this company, is arranging to put in a Chilean Mill at he mine, west of Hill City. A shaft 100 ft. deep on a ledge 8 ft. wide and a number of tunnels and crosscuts comprise the developments.

Yellow Bird.—A steam hoist and pump have been leased by the Harney Peak Tin Company to George Best for this shaft, in Hornblende District, west of Rochford. The shaft is down 90 ft. on a ledge of free-milling ore.

TENNESSEE.

Bradley County.

Chatata Lead and Zinc Company.—This company have located a very rich deposit of lead and zinc near Charleston, Tenn., and will begin extensive operations at once. They are in the market for mining and milling machinery. A. M. Schenck, of Knoxville, Tenn., is general manager.

WASHINGTON.

Ferry County—Republic.

(From Our Special Correspondent.)

Ben Hur.—A trestle from the hoist house is built and a road graded to the main road preparatory to shipping to the Republic Power and Cyaniding Company's mill. The shaft, the best in the camp, was started as a 3, but reduced to a 2-compartment below the fourth set of timbers. The 2-compartments are 4 by 4 ft. 8 in. in the clear. Levels are opened at 115 and 230 ft. On 1st level a 40-ft. crosscut shows a ledge of quartz 3 ft. wide. A drift runs south on \$8 quartz and connects with an upraise from below. On the 2d level the quartz at the crosscut is 18 in. wide and \$10 in value. A drift runs north 120 ft. From 20 ft. in it ran on a pay shoot 80 ft. long and 4 to 6 ft. wide, said to average \$20 per ton, mostly gold. The south drift of 175 ft. has a pay shoot 100 ft. long, averaging 3 ft. wide and about \$30 per ton gold and silver. About 100 tons of this will be shipped to the Republic Mill immediately. The vein is probably the San Poil. The present possible output is 25 tons per day raised with a horse whim, with better equipment 50 or 60 tons a day can be broken. One dump is estimated to contain 200 tons, with an average value of \$20 to \$25 per ton. The other contains 300 tons, with an average value of \$15 per ton.

El Callph.—This claim has been leased for a year. A shaft is down 70 ft. on a small vein of rich ore, which shows native gold. Lessees are driving a short tunnel to intersect the vein and run on it about 140 ft. to tap the bottom of the shaft.

Lone Pine-Surprise.—Ground is broken for a new tunnel to run under the Lone Pine Gulch, from near the main road, so ore can be delivered to a bin for shipment to the Republic Mill. This tunnel will be entirely in the Lone Pine ground and will come under the old Creasor Tunnel, giving about 200 ft. of backs.

Quilp.—A station has been cut out at 400 ft. down the winze. A diamond drill is boring to locate the vein. On the next level, 200 ft. above, ore from the upraise to the No. 2 level is being loaded for shipment. A new upraise from No. 3 level is under way. The mine can furnish 200 tons a day. About 400 tons are now on the dumps.

WEST VIRGINIA.

Mercer County.

(From Our Special Correspondent.)

The work of developing the Crane Creek territory is going rapidly on and considerable work will be done in the Big River coal-field, near Welch, this summer.

Buckeye Coal and Coke Company.—This company is erecting a new tippie.

Elkride.—This company is to add 35 new ovens to its plant in a short time.

Powhatan.—This company has under construction 50 new coke ovens.

WISCONSIN.

Iron—Gogebic Range.

Atlantic.—At this mine near Hurley about 325 men are now employed and about 700 tons of ore are hoisted daily. The new machinery is now ready and mining will go on more smoothly. No. 1 shaft has been retimbered. A. Shepherd is superintendent.

WYOMING.

Carbon County.

Kurtz Chatterton.—The machinery for the 5-stamp mill for this mine at Encampment is being set up. The ore body, discovered several weeks ago, is reported large and rich. The owners have drifted in on the vein 50 ft. and crosscuts are now being run.

FOREIGN MINING NEWS.

AFRICA.

Rhodesia.

The gold production for February is reported by the Chamber of Mines at 12,237 oz. crude. For the two months ending February 28th the total was 23,024 oz. crude, against 11,474 oz. in 1900. The production this year was equal to 18,880 oz. fine gold, or \$390,250.

ASIA.

India—Mysore.

Colar Gold-field.—The total output of the mines in February is reported at 40,764 oz. crude; making a total for the two months ending February 28th of 83,598 oz. gold, against 80,145 oz.

last year; an increase of 3,448 oz., or 4.3%. The total this year was equal to 75,234 oz. fine gold, or \$1,555,087.

AUSTRALASIA.

New, South Wales.

The "Australian Mining Standard" says: "The output of coal and shale in New South Wales in 1900, we gather from a report issued by the Mines Department, shows an increase of no less than 910,469 tons over that of 1899. The output was distributed as follows: Northern District, 3,926,584 tons; Southern District, 1,265,055; Western District, 315,858; or a total of 5,507,497 tons. All the returns are to hand except from one small colliery in the Northern District, which will not affect the result. The increase in the several districts is as follows: Northern, 666,876 tons; Southern, 145,522 tons; Western, 98,041 tons. The total value of the coal at pits' mouth has been returned at £1,668,911, as against £1,325,798 for 4,597,028 tons in 1899. Oil shale worked during 1900 amounted to 22,862 tons, valued at £20,651, as compared with 36,719 tons, valued at £40,823 in 1899. Coke manufactured during 1900 amounted to 126,213 tons, valued at £109,620, as compared with 96,530 tons, valued at £77,129 in 1899. The figures show marked and very gratifying expansion."

Queensland.

The Mines Department reports that the total output of gold in January was 40,396 oz. crude, which compares with 59,861 oz. in 1900, showing a decrease of 19,665 oz., or 32.8%. The output this year was equal to 26,948 oz. fine gold, or \$557,014.

South Australia.

The "Australian Mining Standard" says: "Statistics show that the value of minerals exported from South Australia for 1900 has only twice been exceeded since 1877. The total values reached £451,611, as against £490,833 in 1884, and £461,425 in 1882. Nearly the whole of these amounts were from copper. The value of copper sent away in 1900 was £406,208. The exports of gold from South Australia afford no true index to the actual output from all sources, because much of the precious metal locally raised is absorbed by the banks and jewellers. The sum of £15,582 is a comparatively insignificant total. No really material addition has been given by the yellow metal to the exports of this State since 1887—the year of the Teetulpia Diggings, when over £72,000 worth of gold was sent away. The main hope of South Australia in regard to gold mining at the present juncture is Tarcoola. The wide extent of auriferous area, the rich prospects obtained, and the permanence of gold at depths below 100 ft., have all combined to justify considerable confidence."

CANADA.

British Columbia—Lillooet District.

(From Our Special Correspondent.)

Ben d'Or Mines.—The stamp mill resumed operations on March 1st after having been idle during the winter months owing to the cold. As the mill is run by water power it is not advisable to put in a steam plant for the sole purpose of heating. The mill is crushing 20 tons ore per day and there are, it is reported by the manager, 800 tons of ore on the dump taken from development work carried on during the cold weather.

Lorne Group.—The 5-stamp mill ordered from the Union Iron Works, San Francisco, for this group of mines is being now transported from Lillooet over the ice up Bridge River. It is expected that this mill will be built, all the machinery installed and stamps dropping by July 1st next. This group of mines, together with the Woodchuck mineral claims, were bonded last year to the Mines Exploration, Limited. Leslie Hill is consulting engineer and managing director. A busy season is anticipated in this free-milling section.

British Columbia—West Kootenay District.

Shipments of ore from Three Forks for February amounted to 269 tons, of which the Monitor shipped 95 tons, Corinth 40 and Queen Bess 84.

Athabasca.—The force at this mine near Nelson has been increased to 80 men.

Bosun.—This mine at New Denver is closed down.

Chapeau.—This Nelson mine has been seized by Sheriff Tuck under a number of judgments filed against that property. A mortgage for \$29,000, issued in France, is also out against the mine and buildings.

Hewitt.—Another car-load of ore shipped in the week ending March 9th from this mine at Silverton brings the total shipped for the year up to 470 tons. A body of shipping ore 13 ft. wide is tapped at over 400 ft. deep.

Rambler-Cariboo.—Fifteen men have been added to the force.

Northwest Territory.

Galt Coal Mines.—P. L. Naismith is general manager of these mines at Lothbridge. W. P. Tierney is general agent for British Columbia, with headquarters at Nelson. The production is

now over 600 tons a day and employment is given 300 miners. The coal is a lignite and bituminous and is used on the Canadian Pacific for firing purposes as far east as Brandon. A large portion of the output is also shipped to the United States. The coal is used for domestic purposes, also for smelting, but it does not rival the Crow's Nest Pass coal.

Ontario—Lake of the Woods District.

Buffalo & Niagara Investment Company.—This company, of Buffalo, N. Y., has just completed all the financial arrangements for the development of the Gold Bullion Mining Company's property about 3 miles northeast of Rat Portage, Canada, on the Canadian Pacific Railway, the contracts having been let to J. H. Wilson & Company to sink a shaft 300 ft., 8 by 8 ft., with the necessary cross-cuts and levels. Two car-loads of machinery are already in transit to assist in the development.

Ontario—Rainy Lake District.

(From Our Special Correspondent.)

The Canadian Northern road has now laid track to the west of the Atikokan Range, and is pushing along westerly rapidly with the aid of several thousand men. The line is to be completed this fall. The value of this line to the west Ontario gold-fields is not appreciated by the general public.

Atikokan Explorations.—The diamond drill work by the American Mining Company has demonstrated the continuance of lense of high-grade magnetite ores to a considerable depth. The property is under option for a short time longer.

Golden Star Mining Company.—Nearly all of the \$24,000 assessment called has been paid in and the mine will resume at once. The work will be sinking and increasing the stoping area, which was left in bad shape by the American management.

MEXICO.

Sonora.

Greene Consolidated Copper Company.—Deputy Sheriff Murray, of New York, received an attachment last week for \$1,000,000 against Wm. C. Greene, of Arizona, in favor of Marcus Stine. Mr. Stine alleges that on November 1st, 1899, Mr. Greene entered into an agreement with James Shirley authorizing the latter to sell 100,000 shares of stock of the Greene Consolidated Copper Company, and for each share that Mr. Shirley sold he was to receive one share of stock as his commission. Mr. Shirley entered into negotiations for the sale of 100,000 shares of the stock to Mr. Stine and associates; the negotiations were completed and Mr. Greene ratified the sale and promised to carry it out. Mr. Stine also alleges that he offered to make the first payment of \$50,000 required by the contract of sale, but Mr. Greene refused to complete and repudiated the sale. By reason of the sale Mr. Shirley was entitled to 100,000 shares of stock of the value of \$10 each, and he assigned the rights to Mr. Stine. The suit was begun on January 5th, 1900. Deputy Sheriff Murray served the attachment on the secretary of the Greene Consolidated Copper Company at its New York office.

SOUTH AMERICA.

British Guiana.

The gold production for the month of February, on which royalty was paid, is reported by the Mines Department at 6,287 oz., against 6,285 oz. last year, a difference of 2 oz. only. For the two months ending February 28th the total was 11,620 oz. gold, against 11,175 oz. in 1900; an increase of 445 oz., or 4.0%, this year.

COAL TRADE REVIEW.

New York. Anthracite.

Mar. 29.

The market for hard coal is generally quiet, except for the uncertainty regarding the future, due to strike talk. No increase in buying is to be expected till the spring schedule of prices is announced. The companies have refrained from making new prices until all doubts about labor troubles at the mines were dispelled and have been quoting old prices to prospective buyers. If April 1st passes without a strike being called the spring schedules will appear a few days later. These are expected to bring out a better volume of buying than usual, because consumers have little to hope for in the way of concessions later in the season under the new order of things, and also because supplies on many inland and Western points are unusually low.

Various rumors are in circulation regarding the visit of John Mitchell, president of the United Mine Workers, to New York City, but the general opinion is that something was accomplished in the way of averting a strike and the prospects of a general suspension of work at the collieries are less threatening than a week ago. It is said of Mr. Mitchell, and generally believed, that he cannot be intimidated or bribed, but concerning some of the other officials of the United Mine Workers some unpleasant stories are told

which indicate why a strike is less likely, but these stories probably cannot be verified.

Trade in the West is of small volume. At St. Paul demand has been light, while at the head of the Lakes hard coal supplies are about cleaned up, with the exception of steam sizes, and consumers are burning soft coal and wood. Demand at the lower lake ports is reasonable, but is falling off. Shipments to interior points east and to Canadian territory have held up well. At seaboard points trade is falling off, but is expected to improve when the spring prices are announced.

Coal-buying weather is about past, but the winter at interior points has been a record-breaker in some ways, and coal dealers and producers have no cause to complain of the business done.

Bituminous.

The Atlantic seaboard bituminous trade shows a fair demand for coal. This demand is increasing as first orders on new contracts are coming in. Orders from the shoal water ports that have been closed with ice, particularly those up the Hudson and along the Sound continue. It is stated that producers have agreed to extend old prices for the new contract year. Consumers have been hunting for concessions, so it is reported, with very little success and are now beginning to realize the uselessness of further fighting. It is thought that within a week, seeing no hope for lower prices, consumers will place heavy tonnages.

Trade in the far East is quieter than elsewhere. Along Long Island Sound there is some demand; it is regular and is taking coal at full prices. New York Harbor trade shows no change. All-rail trade is quieter so far as tonnage is concerned; consumers seem to be a little unsettled about placing new contracts.

Transportation from mines to tide is better than it has been, but is still slow. Car supply is short, but is improving. In the coastwise vessel market large vessels are in plentiful supply; small ones are harder to get. We quote current coastwise freight rates from Philadelphia as follows: Providence, New Bedford and the Sound, 65c.; Boston, Salem and Portland, 75c.; Wareham and Newburyport, 85c.; Lynn, 80c.; Portsmouth, 75c.

The f. o. b. prices announced for the coming season's business are as follows: Philadelphia, Clearfield, \$2.35; better grades, \$2.50; Baltimore, Clearfield, \$2.28; better grades, \$2.43; Newport News, New River, \$2.50; Norfolk, Pocahontas, \$2.50; New York Harbor ports, Clearfield, \$2.65; better grades, \$2.85. All the above prices are net to the company.

Birmingham, Ala.

Mar. 25.

(From Our Special Correspondent.)

The coal industry in Alabama is still in an active state. The operators have no trouble in disposing of their product. Good prices obtain for the product and some healthy orders are being filled.

The formation of new coal companies for the purpose of developing coal lands in this State continues. During the past week notice was given of the formation of the Central Iron and Coal Company, whose incorporation was taken in New Jersey and whose principal place of business will be in Tuscaloosa, Ala. This concern proposes to do a large amount of developing around the properties of the Republic Iron and Steel Company in Tuscaloosa County. The Braehed Coal Company was organized during the past week by Allen P. Howison and associates, with a capital stock of \$40,000. This company will operate coal mines in Bibb County. The West Blocton Coal Company was organized by J. W. Miller, W. W. Shortridge and J. E. Sullivan with a capital stock of \$25,000 and coal lands in Bibb County will be developed.

The report that Southern coal dealers who have been purchasing coal in this State had been in Pennsylvania and had placed some large-sized orders there has not disturbed operators here. It appears that D. B. Wood & Son, of New Orleans, after placing some extensive orders in the Walker County coal-fields, had to go north for more coal, not being assured of all the coal they could use from this section.

In labor circles everything seems to be moving along quietly in Alabama. A sub-district organization was formed during the past week in Winston, Walker and Marion counties, to be operated under the State organization. The miners in the counties named will ask for a different contract with the operators in June from that held by the miners in the other counties in the State, as the coal mined in those counties does not go into the manufacture of pig iron.

Chicago.

Mar. 26.

(From Our Special Correspondent.)

Anthracite Coal.—Business in anthracite coal continues in the same moderate way that has characterized this market. There appears nothing to make an increased demand and from week to week the trade expects to sell so much coal and no more. This state of affairs is probably due to the higher prices that have prevailed here all the winter, soft coal having taken the place of hard coal to a considerable extent.

The atmosphere of Chicago has never been more polluted with soft coal smoke than at present, showing the enormous use of that article for domestic and manufacturing purposes. But little coal is now on the docks and rails of the city, rail coal being shipped about as fast as received; but the receipts are very light. Circular is yet \$6 on domestic sizes.

Bituminous coal has been in slightly better demand. Manufacturing concerns and railroads are beginning to place orders and prospects are much brighter than for some time. As yet there has been but little increase in the trade, but shippers are looking forward to the next two months to get rid of a considerable of their surplus coal. Receipts from the mines continue larger than actual demand. Prices are a trifle firmer.

Cleveland, O. Mar. 27.
(From Our Special Correspondent.)

A meeting of the operators of the Pittsburg, West Virginia and Ohio coal-fields was held in this city last week at which an effort was made to fix prices. The members of the conference fell into a dispute as to the differential between the Pittsburg and the Hocking coal. The Pittsburg operators were disposed to grant a differential of 25c. on a ton, but the Hocking operators demanded 40c. On this question they split and the meeting was postponed until some date this week. The demand of the Hocking operators was brought about by a recent ruling of the railroad traffic men abolishing the differential on the rate to the lakes between the two sections; it is now 73c. for both. A slight reduction was at the same time made on the rate to Chicago from all adjacent fields to enable the operators in this section to get their product into the West on an equal footing with the Indiana and Illinois mines.

The sales this week have been moderately heavy, demand continuing good. The railroad situation is not relieved in the slightest, as cars are as scarce as ever, some of the roads finding it almost an impossibility to meet the demands of the shippers. The prices remain as follows: Slack, \$1.20; nut, \$1.50; run-of-mine, \$1.16; three-quarters, \$1.80; lump, \$2; Massillon, \$2.60.

Pittsburg. Mar. 27.
(From Our Special Correspondent.)

Coal.—This month beats all records of coal shipments by water in the history of the coal industry in the Pittsburg district. The rivers have been navigable since the first week in the month and there will be a boating stage for another week at least. Fully 30,000,000 bus. of coal have been already shipped to Southern markets and it is likely that several millions more will be sent out this week. All the returning towboats brought back empty coal boats and barges and the pools and harbor are crowded with empty craft. This will insure steady work for the miners on the river for several months. One of the towboats made three trips with big tows this month, which is the greatest record ever made by any steamer. The conference between representatives of the United Mine Workers and the two coal combinations which began three weeks ago ended this week. The local features of the mining scale were agreed to, but a number of the demands of the miners were refused. A convention of the miners of the Pittsburg District has been called for to-morrow. There is no doubt that a great deal of dissatisfaction will be expressed over the terms of the settlement, but the president of the organization says he does not fear any trouble when the new scale goes into effect on April 1st.

Connellsville Coke.—Prices are firm at \$2 for furnace and \$2.50 for foundry coke. Both shipments and production increased last week. There are less idle ovens this week. Of the 21,447 ovens in the region 19,648 are active and 1,799 are idle. The production for the week was 229,677 tons, a gain of 642 tons. The shipments for the week aggregated 11,223 cars, distributed as follows: To Pittsburg and river tipples, 3,252 cars; to points west of Pittsburg, 5,593 cars; to points east of Connellsville, 2,378 cars. This was an increase of 476 cars.

Foreign Coal Markets. Mar. 29.

Charters from the United States show a lower freight market, particularly to Mediterranean ports. From Philadelphia or Virginia ports to Malta, Marseilles, France, or Trieste, Austria, 13s. 6d. @14s. (\$3.24@3.36), April sailing. These rates are 30c. less than charters booked previously. South American business continues to look up well and ocean freight rates from Baltimore and Norfolk are easier. Charters taken recently were at 16s. (\$3.84) to Para, Brazil, and 15s. 6d. (\$3.72) to Rio Janeiro, the latter rate being a drop of 1s. 6d. (36c.) since February.

An interesting charter is one reported from Newcastle, N. S. W., to Manila at 22s. (\$5.28). This rate is \$3.22 less than was paid from Norfolk, Va., early this year. The ocean freight rate from the United States to the Philippines has changed but very little, though the figure to-day is about \$1 less than a year ago.

A recent report from United States Consul Thackara at Havre, France, says: "Owing to the decided fall which has taken place in the

prices of British coal during the past 4 months and the low freights now prevailing between British ports and those of France, the conditions are not favorable for the American coal exporter. The lowest price I have heard quoted for American steam coal, run-of-mine, along-side of the wharf at Havre is 24s. (\$5.83) per ton. The wholesale prices of British coal, f. o. b. shipping ports per ton of 2,240 lbs., which were ruling February 12th last and have not materially changed since, were as follows:

	Large screened. of-mine.	Run-of-mine.
Best Cardiff	\$4.38	\$2.98
Best Newport	4.01	2.79
Best Northumbrian	2.92	2.12
Best Scotch	2.67	2.31

"The above prices are subject to a discount of 2 1/2% for payment within 30 days, with the exception of those for Scotch coals, which are net."

Messrs. Hull, Blyth & Co., of London and Cardiff, write as follows, under date of March 16th: The dearth of tonnage still continues and coals for prompt shipment rule easier. Quotations are: Best Welsh steam, \$4.08@4.20; seconds, \$3.96; thirds, \$3.72; dry coals, \$3.60@3.72; best Monmouthshire, \$3.72@3.84; seconds, \$3.36@3.60; best small steam coal, \$1.62@1.74; seconds, \$1.44@1.50; other sorts, \$1.20.

These prices for Cardiff coals are f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire coal are f. o. b. Newport, exclusive of wharfage, and are for cash in 30 days, less 2 1/2% discount.

Tonnage continues scarce and rates firm. Some charters noted are: Marseilles, \$1.85; Naples, \$1.92; Genoa, \$1.98; Singapore, \$3.84; St. Vincent, \$1.62; Buenos Aires, \$3.72; Rio Janeiro, \$3.96.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 422.)

New York. Mar. 29.

Heavy Chemicals.—The soda products are firm, though business is not large. Second hands have unsettled the bleaching powder market, and sales of prime goods are reported at \$1.62 1/2 @ \$1.75 per 100 lbs., while importers' views are unchanged as below. It is learned that although the works of the North American Chemical Company, the United Alkali Company's branch in Michigan, have been in regular operation during the past year, the earning profits have not yet attained to such results as the directors consider they should and will, it is hoped, presently yield.

We quote per 100 lbs. as follows: Domestic soda ash in bulk is worth 2 1/2c. per 100 lbs. less than quotations below:

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	In New York.
Alkali, 58% 48%.	50@55 85@90	.....	85@87 1/2
Caustic Soda, high test..... powd., 80% 70@74% 98%.	\$1.90@1.95 ..... .....	..... 2.75 2.85 3.25	1.95@1.87 1/2 3.75@4.00 67 1/2
Sol Soda..... "conc." Bicarb. Soda..... "extra	50 1.25@1.50 1.00@1.12 1/2 3.25@3.50	..... ..... .....	..... 1.75 1.37 1/2@3.00
Bleach Pdr., Am. prime..... Eng. prime..... other brands..... Chl. Pot. Cryst. "powd."	1.80 ..... ..... ..... .....	..... ..... 8.00@8.25 8.25@8.50	2.06@2.10 1.75@1.90 9.25@9.50 9.50@9.75

Cyanide of Potash.—The demand is unsatisfactory. Prices are unsteady, though importers ask 25c. per lb., but this figure can doubtless be shaded on a large order.

Acids.—The differences between acetic acid makers have been partly adjusted, and so prices are again steady. Sulphuric acid is better inquired for, especially for export. Blue vitriol is quiet.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, No. 8.....	\$1.62 1/2	Nitric, 36°.....	\$3.87 1/2
Blue Vitriol.....	5.00@5.25	Nitric, 38°.....	4.12 1/2
Aqua Fortis, 36°.....	3.62 1/2	Nitric, 40°.....	4.37
Aqua Fortis, 38°.....	3.87 1/2	Nitric, 42°.....	4.75
Aqua Fortis, 40°.....	4.12 1/2	Oxalic.....	5.75@6.00
Aqua Fortis, 42°.....	4.50	Sulphuric, 66°.....	1.20
Muriatic, 15°.....	1.20	Sulphuric, 80°.....	1.05
Muriatic, 20°.....	1.35	" " " " "	14.00
Muriatic, 22°.....	1.50		

Brimstone.—The New York import of 900 tons, and the expected safe arrival at Philadelphia of the delinquent steamer "Jupiter" with 5,000 tons, resulted in an easier market. Sales of best unmixed seconds ex-vessel are noted at \$22, and to arrive at \$22@22.50, while future shipments are worth \$21.25@21.50 per ton, according to position. Best thirds are \$2 less per ton. The imports of brimstone into Great Britain in the two months ending February 28th amounted to 3,727 tons, or 153 tons less than last year.

The shipments of brimstone from Sicily in

February and the two months of this year are reported to us by Messrs. Emil Fog & Sons, as below, in long tons:

Destination.	February.	Two months.
America (U. S.).....	4,850	11,500
Austria.....	909	2,451
Belgium.....	23	51
France.....	12,307	21,872
Germany.....	2,265	2,655
Greece and Turkey.....	5,065	6,656
Holland.....	3,230	3,368
Italy.....	7,057	15,435
Portugal.....	4,862	5,070
Russia.....	94	113
Spain.....	1,087	1,397
Sweden and Norway.....	325	1,926
United Kingdom.....	1,710	3,546
Other countries.....	1,687	2,025
Total, tons.....	45,471	78,065

In the corresponding two months last year the exports totaled 91,893 tons, showing that in 1901 there is a falling off of 13,823 tons, or 15%. The decrease in exports to America alone in 1901 is nearly 15,000 tons, or about 57%. Stocks in Sicily on March 1st, 1901, were 231,325 tons, or 21,008 tons less than last year, which shows that production is being kept well in hand by the syndicate.

Pyrites.—New York imports this week were 8,435 metric tons copper pyrites from Spain, of which nearly one-half was consigned to the Pennsylvania Salt Manufacturing Company. Present freight rates from Huelva, Spain, to Atlantic ports are about 9s. (\$2.16). Domestic miners report a fair demand at unchanged prices. In the two months ending February 28th Great Britain imported 129,403 long tons pyrites which is 4,017 tons less than last year.

Sulphate of Ammonia.—The market is easier at \$2.75@2.77 1/2 per 100 lbs., for 24@25% gas liquor. The shipments from Great Britain to the United States in February were 456 long tons, bringing the total for the two months this year to 1,059 tons, showing an increase of about 60 tons over last year.

Potash Salts.—As the bulk of trade contracts have been booked, business is comparatively quiet. Agents of the German Kali Works quote net prices as follows for New York, Boston or Philadelphia shipment: Muriate of potash, 80@85%, \$1.33 per 100 lbs.; muriate of potash, 95%, \$1.86; sulphate of potash, 90%, \$2.11; sulphate of potash, 96%, \$2.13 per 100 lbs.; double manure salt, 48@53%, \$1.12 per 100 lbs.; kainit, testing 12.4% actual potash, \$9.05 per long ton; sylvinit, 38 1/2% per unit of sulphate of potash; manure salt, 20% actual potash, 66c. per 100 lbs.

Nitrate of Soda.—The firm coast freight market has been reflected here. Sales of both spot and future nitrate of soda have been made at \$1.80@1.82 1/2 per 100 lbs. Nevertheless trade is quiet. The "Membrand" arrived with 33,000 bags.

Phosphates.—A few more orders have been booked, though trade is still quiet. A charter is noted from a Florida port to Dublin, Ireland, at 15s. 6d. (\$3.72), April sailing. The imports of phosphates into Great Britain in the two months ending February 28th amounted to 65,194 long tons, or 8,153 tons less than last year.

Concerning foreign phosphates, we hear that the demand for Algerian continues regular, though competition is keen with some of the lower grade American rock. For Christmas Island pebble phosphates the demand exceeds the production. It is estimated that since January, 1900, between 35,000 and 40,000 tons have been shipped to England, Germany, Japan and Australia. The profit on these sales is understood to have averaged nearly \$5 per ton. When the projected improvements in operating the phosphate beds have been made, it is believed the output will be not far from 100,000 tons annually. At present there are over 620,000 tons of phosphate in sight. So far only crude rock has been exported, but as soon as practicable the syndicate controlling the deposits will erect its own superphosphate plant, possibly at Singapore, for convenience. In Russia superphosphates are to be manufactured largely from native raw materials. Superphosphates will also be made from Thomas (basic) slag from the Kertch Iron Works. The slag contains, it is said, about 20% phosphoric acid.

Phosphates.	Per Ton F. o. b.	C. I. f. U. n' d Kingdom or European Ports.	
		Unit.	Long ton.
* Fla. hard rock (77@80%)	\$6.50@7.00	7 1/4@7 3/4	\$11.31@12.09
* Fla. land pebble (68@73%)	3.85@4.00	6 1/4@6 1/2	8.75@9.10
* Fla. Peace River (58@63%)	2.50@2.75	6 1/4@6 1/2	7.50@7.80
† Tenn. rock 78% export.	3.25@3.50	6 1/4@7 d	10.53@10.92
† Tenn.....78% domestic.	3.00	.....	.....
† Tenn.....75% " "	2.75	.....	.....
† Tenn.....72% " "	2.50	.....	.....
‡ So. Car. rock, crude.....	2.50@2.75	.....	.....
‡ So. Car. rock, dried.....	3.25	.....	.....
Algerian, rock.....(63@70%)	.....	6 1/4@7 d	8.71@9.3
Algerian, rock.....(58@63%)	.....	6 @ 6 1/4 d	7.20@7.80
Tunis, Gafsa.....	.....	6 @ 6 1/4 d	7.00@7.80

* Fernandina, † Mt. Pleasant. ‡ At mines. § On vessels, Ashley River.

Liverpool.

Mar. 24.

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

The export demand for chemicals continues dull and sluggish. The Board of Trade returns of exports for the month ending February 28th show a marked decline as compared with February, 1900. Shipments for the month are as follows:

Bleaching Powder.—To all quarters, including United States, 59,281 cwts.; to United States alone, 50,996 cwts. Soda ash, 94,806 cwts.; caustic soda, 67,161; bicarb. soda, 22,090; soda crystals, 12,081; sulphate (saltcake) 36,307; other sorts of soda, 7,515; total, 239,960 cwts. Compared with the corresponding month of last year, the decrease is about as follows:

Bleaching powder, on total exports to all countries, including United States, 54%; exports to United States alone, 46%; countries other than United States, 77%. Sodas, on total exports to all countries, including United States, 25%.

Soda ash is without change, and while export quotations vary as to market, the nearest range for tierces may be called about as follows: Le-blanc ash, 48%, £5 15s. @ £6; 58%, £6 2s. 6d. @ £6 7s. 6d. per ton, net cash. Ammonia ash, 48%, £4 10s. @ £4 15s.; 58%, £4 15s. @ £5 per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in fair domestic request and steady at £3 7s. 6d. @ £3 10s. per ton, less 5% for barrels or 7s. less for bags, with special terms for certain favored markets. Caustic sodas are in moderate demand at late rates. We quote: 60%, £9 5s.; 70%, £10 5s.; 74%, £10 15s.; 76%, £11 @ £11 5s. per ton, net cash.

Bleaching powder is inactive, the bulk of the home trade consumers being filled up on contracts, while export orders are scarce. For hardwood packages, £7 5s. per ton net cash is nominal range, with special quotations for certain competing markets.

Chlorate of potash is offered at 3½@3¾d. per lb. net cash, but there is only a limited inquiry.

Bicarb. soda is in fair demand at £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowance for larger packages, also special terms for certain favored markets.

Sulphate of ammonia is still languid at about £11 @ £11 2s. 6d. per ton, less 2½% for good gray 24@25%, in double bags f. o. b. here.

Nitrate of soda meets with rather more attention from buyers, and is steady on spot at £8 12s. 6d. @ £8 17s. 6d. per ton, less 2½% for double bags f. o. b. here, as to quantity and quality.

IRON MARKET REVIEW.

NEW YORK, Mar. 29, 1901.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending		From	
	Mar. 30, 1900.	Mar. 29, 1901.	Jan., '00.	Jan., '01.
	F'ces.	Tons.	F'ces.	Tons.
An'racite & Coke.	264	286,350	222	285,750
Charcoal.	29	7,175	26	8,175
Totals..	293	293,525	248	293,925
				3,769,724
				3,446,720

The iron trade has been very active in all departments, as is shown by our local letters. Sales of Bessemer, basic and foundry irons have been large, generally at slight advances in price. Steel billets have been in demand also.

For finished material of almost all kinds the demand is good and large transactions are reported. There have been few sales of standard rails, but a number of contracts for girder rails have been closed recently, or are now under discussion.

Some export orders are being filled, but in the present depressed condition of demand and prices in Europe the prospects for foreign trade are not so good as they were a few months ago.

Birmingham, Ala.

Mar. 25.

(From Our Special Correspondent.)

Firm and steady is the condition of the Alabama pig iron market at present. There are indications of another advance in prices and the demand keeps up well. An advance of 25c. per ton is looked for within the next few days, making the total advances in the last four weeks \$1 per ton. There are some healthy inquiries being received by the furnacemen in this State. The shipments are quite heavy and bid fair to reduce the accumulated stocks in this district. The furnaces in operation in this State are producing a large quantity of iron.

The Sloss-Sheffield Steel and Iron Company has one of its city furnaces out of blast for repairs. The same company has two furnaces in the neighborhood of Florence and Sheffield, Ala., ready for the torch on very short notice. The Tennessee Coal, Iron and Railroad Company has four of its five blast furnaces at Ensley in operation, while pretty near all of the blast furnaces at Bessemer, in Birmingham and in Oxmoor, are producing iron. The Republic Iron and Steel Company has two furnaces at Thomas, producing iron, and the work on the big new furnace at the same place is being rushed. The Woodward Iron Company has two furnaces in operation. The Alabama Consolidated Coal and Iron Company has two furnaces in operation. The Shelby

Iron Company has one or two furnaces making iron. Two of the Tennessee Company's furnaces in the neighborhood of Sheffield, Ala., are in blast. Furnaces at Trussville, Birmingham, Ironton, Anniston, Ensley and Bessemer can be placed in operation on very short notice.

The following quotations are given in this section: No. 1 foundry, \$11.50@12; No. 2 foundry, \$11.25@11.50; No. 3 foundry, \$10.75@11.25; No. 4 foundry, \$10@10.50; gray forge, \$9.75@10.25; No. 1 soft, \$11.50@12; No. 2 soft, \$11.25@11.50.

There is a fairly good demand for finished iron and the rolling mills are working steadily. There is considerable work being done by the foundries and machine shops in the Birmingham district. An order has been received by the Birmingham Machine and Foundry Company, in East Birmingham, for 7 large-sized Corliss engines. The order was received from a Cuban sugar refining concern. It amounts to more than \$100,000. The Hood Machine and Foundry Company is making plans for the erection of a new steel, iron and brick shop on their present site in this city. The work on the plant of the Hardie-Tynes Foundry and Machine Company is being rushed and will shortly be completed. The steel plants at Ensley are losing no time. The nail, wire and rod mill is doing as well as ever. The plant of the Austin-Bryan Manufacturing Company, makers of steel plows, etc., is busy and the company has commenced work on the foundations for two new buildings. It is proposed to manufacture other agricultural implements besides plows.

Buffalo.

Mar. 27.

(Special Report of Rogers, Brown & Co.)

The active buying movement which started in the West, sending up Bessemer iron several dollars per ton and materially advancing foundry iron, has gradually worked its way East. During the past week or 10 days heavy orders have been placed for round lots, both for early delivery and for delivery during the next six months and in some cases clear through the year. The business booked has covered all kinds of foundry and forge iron. It has cleaned up accumulated stocks and given local furnaces sufficient business to make it really necessary to advance prices to the basis mentioned below. In all cases the iron contracted for has been to cover actual necessities, and the purchases have not been speculative. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$15.50; No. 2, \$15; Southern soft, No. 1, \$16.65; No. 2, \$16.15; Lake Superior charcoal, \$17.50; coke malleable, \$15.50.

Chicago.

Mar. 26.

(From Our Special Correspondent.)

Pig Iron.—Foundrymen and others are coming to the conclusion that their requirements in pig iron will be much larger than they expected and accordingly there has been some good buying here during the past week, a number of sales exceeding 500 tons and one or more above 2,000 tons. Business is good with iron consumers; foundrymen and others have been buying freely. Fully 20,000 tons of iron have been disposed of during the past week and as much more will be sold the coming week. Southern and Northern iron prices have advanced, the former 25c. and the latter 50c. per ton. Quotations are as follows: Lake Superior charcoal, \$17.50@18; local coke foundry, No. 1, \$16@16.50; No. 2, \$15.50@16; No. 3, \$15@15.50; local Scotch, No. 1, \$16.25@16.50; Ohio strong softeners, No. 1, \$16.50@16.75; Southern silvery, according to silicon, \$15.90@16.35; Southern coke, No. 1, \$15.90@16.35; No. 2, \$15.15@15.40; No. 3, \$14.65@14.90; Southern, No. 1, soft, \$15.65@15.90; No. 2, soft, \$15.15@15.40.

Cleveland, O.

Mar. 27.

(From Our Special Correspondent.)

Iron Ore.—At the conference here the last week between the dock managers of south shore ports of Lake Erie and the Longshoremens the rate for unloading iron ore from vessels was fixed. The ore shovellers get 13c. a ton, a reduction of 1c. from last year, and the engineers and hoisters have accepted a reduction of \$5 a month. A clause in the agreement prevents strikes, either from a grievance or through sympathy with any other organization. The Ore Association has not fixed prices as yet, but a meeting here the latter part of the week is expected at which this result will likely be accomplished. No contracts have been made by the vessel interests so far, that matter depending upon the sales of ore which have not been made. All indications now are for a heavy consumption of ore and a late opening of the season of navigation which may bolster up rates. Just now no surmises as to the possible rates are hazarded.

Pig Iron.—The market has been steady and inclined to be a little more quiet than has been the case for the last few weeks, a possibility of a combination of the merchant plants seeming to make buyers cautious. Sales have been limited to small quantities, as the furnace capacities are pretty well sold up for the remainder of the first half of the year. The prices are still quoted on the following basis: Bessemer, \$16.50, Valley furnace; basic, \$16; No. 1 foundry, \$15; No. 2 foundry, \$14.50, Valley furnace.

Finished Material.—The many reports of ad-

vances in the price of structural material resulted this week in the heaviest sales of the year. Contracts which have been hanging fire for several weeks have been closed, the sales amounting in the aggregate to about 10,000 tons. The specifications for the buildings of the Brown Hoisting Company have been presented to the mills and the material will be shipped at once and the buildings erected. The demand for plates is not very heavy, but some sales are being made. The Carbon Steel Company and the Otis Mills have capacity that is not covered by orders and are able therefore to make prompt deliveries, hence are scooping up a great deal of business. Billets are still in demand, one order of about 5,000 tons having been placed this week. These were of Bessemer quality and sold at \$24.50. Open-hearth billets are quoted at \$21.50. Bars are in good demand, with a variety of prices being quoted. It seems as if the market might most accurately be represented in a quotation of 1.45c. at mill. Some few mills are anxious to get orders, but most of them are turning business away. An order for 4,000 tons of rails for electric roads has been placed this week, the new track to be laid on recently projected lines in northern Ohio.

Old Iron.—The market has been fairly firm this week, with upward tendencies noted in a few grades. For the most part, however, the consumers refuse to pay the high prices and those who are anxious to dispose of what material they possess revert to the quotations made a week ago. These are so generally used that they probably represent the market more accurately than those which the dealers have striven to make. The market, therefore, stands: Wrought turnings, \$10; cast borings, \$6.50; car wheels, \$19; steel rails, \$16; iron rails, \$21; cast scrap No. 1, \$13; wrought No. 1, \$17.50.

Philadelphia, Pa.

Mar. 28.

(From Our Special Correspondent.)

Pig Iron.—Scarcely any change is noted in the pig iron market. The urgency to sell is apparent. Makers are acting on the defensive; the belief is gaining ground that a higher level of prices is not remote and the companies do not care to be sold far ahead. Mill owners are not anxious to load up with forge iron in view of the uncertain mid-summer demand for finished material. They say there is less momentum in demand than a month ago. This accounts for some rumors as to shading. The general quotations for iron are: No. 1 X foundry, \$16@16.25; No. 2 X foundry, \$15@15.25; No. 2 plain, \$14.25@14.50; standard forge, \$14@14.25; ordinary, \$13.50; basic, \$14; Bessemer at furnace, \$15.

Billets.—Transactions have been closed within a day or two at top prices, \$23@23.50. Buyers are temporarily supplied. There is not the same confidence here that there is in the West regarding the continued strength of billets. Consumers' future necessities are very lightly covered.

Merchant Bars.—A careful canvass shows that a number of our bar mills are well supplied with orders for from six weeks to two months and that most of these could even now increase their orders were they so inclined. The inquiry also shows that there is just enough capacity in need of orders to rather weaken prices. The consumption is heavy, but some of the larger buying interests have gone out of the market. Iron bars are 1.35c.@1.50c.; steel, 1.60c.

Pipes and Tubes.—A greater consumption than for years is in progress. Tubes have been advanced this week on individual purchases for quick delivery. It is impossible to give prices, but buyers are looking for a general advance next week.

Merchant Steel.—Local agents have been hampered by the irregularity of deliveries on orders placed some time ago. Prices for early deliveries are stronger than a week ago. The tone of the market is very strong and there is slightly more business offering than agents can make definite promises for.

Plates.—The pressure for both large quantities for delivery spread over months and of small lots for prompt delivery is stronger than ever. Manufacturers are advising their customers to cautious ordering and are assuring them they can be and will be taken care of without undue advances. Large consumers are inclined to kick over the traces and stir up a dust, the effect of which if persisted in will be to create a little bit of a panic for which there is no real occasion. Quarter-inch plates are booked at 1.70c.; universals about the same. There is an active demand for charcoal plates and they range from 2.25c. to 3.25c.

Pittsburg.

Mar. 27.

(From Our Special Correspondent.)

The sales of Bessemer pig iron exceed those of last week and the price is 50c. a ton higher. The American Steel and Wire Company was the heaviest purchaser. Prices of all grades of pig iron have advanced this week and considerable new business was placed. The prices in all lines of finished steel products are increasing

almost daily. Tank plates command a premium over the rate fixed by the pool, sales having been made at from \$1 to \$2 above the quoted price. Among the features of the market this week was the advance for structural material. Beams and channels are \$2 and angles \$4 a ton higher. This advance was ordered at a meeting of the associated manufacturers, or the Beam Pool, held in New York yesterday. An increase in prices has been expected for some time, but it was believed that the new rate would be \$5 higher. A large amount of new business has been received and all the mills are now well filled with orders. Bessemer steel billets are higher than at any time since last June. Open hearth billets are scarce. The demand for pipes and tubes is unprecedented, all the combination and independent plants being operated to their fullest capacity. The National Tube Company this week advanced the price of boiler tubes 3%. It is reported that an advance in the price of pipe will soon be ordered. The demand for black sheets continues despite the additional advance in prices made last week. The latest advance of \$3 a ton makes a total increase of \$7 a ton within three weeks. The price for No. 28 gauge is now higher than at any time since the boom year of 1899, except the month of April last year, when prices stiffened, owing to an increased demand. The American Sheet Steel Company, the combination, on Monday put in operation its new plant at Struthers. The initial run was unusually successful. If the demand continues, which now seems likely, the combination will soon have all of its plants in operation.

The proposed consolidation of the merchant blast furnaces of the Mahoning and Shenango valleys and certain stacks in Pittsburg and Cleveland is assuming definite shape, and indications point to the success of the project. The plans contemplate the taking in of 21 furnaces. A number of the furnace companies control sufficient ore properties to supply all the requirements of the furnaces that are to be included in the combination. They also have coke properties and by building more ovens will not be dependent on outside concerns for either ore or coke. The capacity of the furnaces that are to form the proposed combination is about 30,000 tons of pig iron per week. The principal object of the consolidation is to prevent an accumulation of stocks by closing furnaces when the demand falls off in order to maintain prices. The furnace workers whose wages were reduced on February 1st, when the price of pig iron was low, have made a demand for an advance of 20c. a day, to take effect on April 1st. This is a restoration of the reduction of 10c. a day additional. The furnace owners have not yet replied to the demand.

Pig Iron.—The sales of Bessemer pig iron this week aggregated 30,000 tons, the price being \$16.50, Valley furnaces, or \$17.25, Pittsburg. Gray forge and foundry iron advanced during the week. About 8,000 tons of the former were sold at \$14.50@14.75, Pittsburg, and about 3,000 tons of foundry No. 2 were sold at \$15@15.25.

Steel.—About 2,000 tons of Bessemer steel billets were sold this week at \$24, the highest price since last year. Open-hearth billets are quoted at \$27, but no sales were made. Tank plates are still quoted at 1.50c., but sales made this week were at 1.55@1.50c. Steel bars are also higher this week, being firm at 1.50c.

Sheets.—The demand for black sheets continues and was not checked by the advance of \$3 a ton made last week by the American Sheet Steel Company. The combination is meeting the demand by putting idle plants in operation. The independent mills have orders that will keep them busy until July. No. 28 gauge is quoted at 3.30@3.35c. and galvanized sheets at 70% off, with no freight allowance.

Ferro-manganese.—There is a good demand and the price of 80% domestic remains at \$62.50.

Cartagena, Spain. Mar. 18.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—During the month of February 43,400 tons of iron ore have been shipped from this port, 3,000 tons of which were for the United States and the remainder for the United Kingdom and Continent. Considerable animation has been observed in the shipments during the past month, but this unfortunately has not been due to any improvement in the market, but solely to the complete drop in the rates of freight. Many of the shipments correspond to sales during last year and balances of old contracts still remain to be shipped. Several new f. o. b. sales have been reported at 1s. to 2s. per ton, lower prices than they were 12 months since. Owing to the heavy shipments considerable reduction has been made in the accumulated stocks and miners will now probably do an easier small business, if not at firmer prices at least without further reduction.

Quotations are as follows, f. o. b. Cartagena, for prompt shipment, buyer to pay any new tax which may be imposed: Ordinary 50% Portman, 6s. 6d.@7s.; special low phosphorus, 6s. 9d.@7s. 3d.; extra quality, 7s. 9d.; special ore 3% Mn. and 6% S, 8s. 3d.; specular ore, 60% iron, 10s.; lumpy magnetic ore, 11s. 6d. For manganiferous ores quotations are: No. 1, 20% Mn and 20%

Fe, 14s. 3d.; No. 1 B, 17% Mn and 25% Fe, 11s. 3d.; No. 2, 15% Mn and 30% Fe, 11s.; No. 3, 12% Mn and 35% Fe, 8s. 9d.

Other Exports.—These include 350 tons ocher to Bristol; 250 tons iron pyrites to Genoa, and 100 tons to St. Louis.

New York. Mar. 29.

The local iron market is firmer and the volume of business shows improvement. In recent foreign shipments we note \$25,000 worth of finished iron, \$15,000 worth of railway material and \$25,000 worth of machinery to Australia, \$19,000 worth of manufactured iron to South Africa, and \$15,000 worth of railway material to Chile.

Pig Iron.—The local market can hardly be called strong, but buying holds up fairly well. We quote for Northern iron, tidewater delivery: No. 1 X foundry, \$16.25@17.25; No. 2 X, \$15.50@16; No. 2 plain, \$14.75@15.25; gray forge, \$14.50@14.75. For Southern irons on dock, New York, No. 1 foundry, \$15.75@16.25; No. 2, \$15.25@15.75; No. 3, \$15@15.50; No. 4, \$13.75@14.25; No. 1 soft, \$15.75@16.25; No. 2, \$15.25@16.75.

Bar Iron and Steel.—Business is good. We continue to quote common bars at 1.35c. for large lots on dock; refined bars, 1.45c.; soft steel bars, 1.50c.

Plates.—Prices are firmly maintained and local business is good, mostly from shipyards. Eastern mills are busy. One large concern reports more orders on its books now than ever before. We quote for large lots at tidewater: Tank, 1/4-in. and heavier, 1.70c.; flange, 1.80c.; marine, 1.95c.; universal, 1.70c.

Steel Rails and Rail Fastenings.—No new domestic business of importance is reported. Export demand is fair. Standard sections are still quoted at \$26 at Eastern mills; light rails at \$26@30, according to weight. Spikes are 1.55c.; splice bars, 1.30c.; bolts, 2.10@2.25c.

Structural Material.—Demand is good. We give new quotations for large lots at tidewater as follows: Beams, 1.75c.; channels, 1.75c.; angles, 1.50c.

METAL MARKET.

New York. Mar. 29.

Gold and Silver.

Gold and Silver Exports and Imports At all United States ports in February and year.

Metal.	February.		Year.	
	1900.	1901.	1900.	1901.
GOLD.				
Exports	\$1,403,658	\$417,612	\$7,094,948	\$8,638,771
Imports	1,911,116	1,830,274	3,907,808	5,991,286
SILVER.				
Exports	\$507,458	\$1,412,662	\$3,191,140	\$2,647,485
Imports	4,952,844	4,580,499	9,552,043	9,370,738
Excess	E. 2,841,033	E. 2,829,927	E. 5,015,606	E. 5,998,961
Excess	E. \$2,111,811	E. \$1,750,572	E. \$4,536,437	E. \$3,371,777

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

Gold and Silver Exports and Imports, New York

For the week ending March 28th, 1901, and for years from January 1st, 1901, 1900, 1899 and 1898.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	\$129,000	\$119,670	\$592,115	\$157,669	E. \$443,770
1901.	9,279,965	778,885	9,127,909	1,025,669	E. 16,603,326
1900.	2,325,984	1,065,704	9,823,450	1,082,884	E. 10,600,840
1899.	1,227,229	4,645,644	7,453,253	728,756	E. 3,206,086
1898.	3,835,335	31,033,611	9,721,309	1,332,863	E. 18,812,332

Exports of gold were chiefly to France; imports from the West Indies. The silver exported went chiefly to London; that imported came from Mexico and South America.

The United States Assay Office in New York reports the total receipts of silver at 31,000 oz. for the week. This makes a total of 893,000 oz. from January 1st.

Average Prices of Metals per lb., New York.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1901.	1900.	1901.	1900.	1901.	1900.	1901.	1900.
Jan.	16.25	15.58	26.51	27.07	4.35	4.68	4.13	4.65
Feb.	16.39	15.78	26.68	30.58	4.35	4.675	4.01	4.64
March.	16.29	16.29	26.51	32.90	4.35	4.675	4.01	4.60
April.	16.78	16.34	26.51	30.90	4.35	4.675	4.01	4.71
May.	16.34	16.34	26.51	29.37	4.35	4.675	4.01	4.53
June.	15.75	15.75	26.51	30.50	4.35	4.675	4.01	4.29
July.	15.97	15.97	26.51	33.10	4.35	4.675	4.01	4.28
Aug.	16.35	16.35	26.51	31.28	4.35	4.675	4.01	4.17
Sept.	16.44	16.44	26.51	29.42	4.35	4.675	4.01	4.11
October.	16.37	16.37	26.51	28.54	4.35	4.675	4.01	4.15
Nov.	16.40	16.40	26.51	28.25	4.35	4.675	4.01	4.29
Dec.	16.31	16.31	26.51	26.94	4.35	4.675	4.01	4.25
Year.	16.19	16.19	26.51	29.90	4.37	4.675	4.01	4.59

The prices given in the table for copper are the averages for electrolytic copper. The average price for Lake copper for the year 1900 was 16.32c.; for the month of January, 1901, it was 16.77c.; for February, 16.90c.

Prices of Foreign Coins.

	Bid.	Asked.
Mexican dollars.....	\$.49	\$.51
Peruvian soles and Chilean pesos ..	.43	.465
Victoria sovereigns.....	4.85	4.88
Twenty francs.....	3.84	3.88
Twenty marks.....	4.73	4.78
Spanish 25 pesetas.....	4.78	4.82

Imports and Exports of Metals.

Port.	Week, Mar. 27.		Year 1901.	
	Expts.	Impts.	Expts.	Impts.
New York.				
(N. Y. Metal Exchange.)				
Aluminum.....long tons		5	41	30
Antimony ore.....			19	188
" regulus.....			19	267
Copper, fine.....	686	240	16,229	3,961
" matte.....	57		512	30
" ore.....				13,390
" ash.....				
Iron ore.....				
" pig, bar, rod.....	483	25	5,945	636
" plates, sheets.....	20		221	
Lead.....	2,040	810	20,157	14,520
" ore.....			1,629	100
Manganese ore.....			40	660
Metals, old, scrap.....				3,093
Composition.....				2,571
Nails.....	228			493
Nickel.....	66			11,590
" ore, matte.....				5,569
Pipe, iron & steel.....	436			7,639
Railroad material.....	283			
Rails, old.....				
Steel bars, plates.....	396	86	20,937	3,127
" rails.....	706		22,753	
" wire.....	303		7,832	
Tin.....		280	230	6,902
" and black plates.....		659		6,450
" dross.....				487
Zinc.....	12			123
" dross.....				245
" ashes, skim.....				4,109
" ore.....				
Baltimore.				
(Special Correspondence.)				
Antimony.....long tons				10
Chrome Ore.....		301		301
Copper, fine.....	95	30	58,58	1,628
Iron pig, bar, etc.....		27	1,218	1,787
" ore.....		6,594		60,513
Manganese ore.....		3,780		7,030
Nails.....				306
Pipe, iron & steel.....		44		693
Spiegeleisen.....		159		32
Steel, bars, etc.....		168	5	29,384
" wire.....		29		563
" rails.....		2,111		25,709
Tin.....				175
" and black plates.....				97
Philadelphia.				
Copper, fine.....long tons				493
" ore.....				7,860
Iron, pig, bar.....	38	248	172	1,655
" ore.....		2,560		57,570
" pipe.....		8		880
Lead.....				200
Manganese ore.....				875
Metals, old.....				29
Nails.....				71
Railroad material.....				175
Steel, bars, etc.....				3,737
" rails.....				3,776
" wire.....				150
Tin.....				25
" and black plates.....				185
Zinc ore.....				2,061
" dross.....				77
" ash.....				32

Total United States.

Articles.	Jan., 1901.		Jan., 1900.	
	Expts.	Impts.	Expts.	Impts.
Antimony.....long tons		171		86
" ore.....	2	17		342
Copper, in all forms.....	10,003	7,980	14,035	6,435
" pig & bar.....	24,722	2,276	9,931	6,241
" ore.....	440	33,353		69,715
" steel plates.....	5,235	188	1,985	1,171
" iron & steel rails.....	25,596	116	17,406	288
" wire.....	6,339	828	6,229	137
Lead, in all forms.....	10,381	15,512	4,779	4,302
Manganese ore.....				
" and oxide.....		8,809		35,256
Nickel.....&matte.....	240	12	131	
Nails, cut.....	3,167		835	
" wire.....	1,693		4,195	
Quicksilver.....	24		27	
Steel, billets.....				
" rods, etc.....	8,987	1,211	2,339	4,566
Tin.....	52	3,316	8	4,927
" &black plates.....	101	4,565	15	6,369
Zinc.....	50	129	1,691	224
" ore.....	3,661		2,250	

Import Duties on Metals.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 4c. a lb. Lead, 1 1/2c. a lb. on lead in ores; 2 1/2c. per lb. on pigs, bars, etc.; 2 1/2c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1 1/2c. per lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

Average Prices of Silver per oz. Troy.

Month.	1901.		1900.		1899.	
	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.
January...	25.97	63.12	27.30	59.90	27.42	59.36
February...	25.13	61.06	27.49	59.76	27.44	59.42
March.....	27.59	59.81	27.48	59.64
April.....	27.41	59.59	27.65	60.10
May.....	27.56	59.96	28.15	61.23
June.....	27.81	60.42	27.77	60.43
July.....	28.23	61.25	27.71	60.26
August.....	28.13	61.14	27.62	60.00
September...	28.55	62.63	27.15	58.89
October.....	29.58	63.83	26.70	57.98
November.....	29.66	64.04	27.02	58.67
December.....	29.68	64.14	27.21	58.99
Year.....	28.17	61.41	27.44	59.58

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Financial Notes of the Week.

Business seems slightly less active, and there is a quieter tone to the markets. Money is less easy, and rates are a little higher. A small lot of gold, \$250,000, was taken on Wednesday for shipment to France, and other exports are booked. The demand for money in London is strong, and rates of interest are high.

The Indian Government having reduced its purchases, and no large inquiry developing in other quarters, silver has declined to 27 7/16d. and closes with London market weak at that figure.

The statement of the United States Treasury on Wednesday, March 27th, shows balances in excess of outstanding certificates as below, compared with the corresponding day last week:

	Mar. 20.	Mar. 27.	Changes.
Gold.....	\$83,230,351	\$97,245,357	I. \$3,995,006
Silver.....	18,147,888	18,000,109	D. 147,779
Legal tenders.....	9,597,435	10,169,911	I. 572,506
Treas. notes, etc..	139,485	127,717	D. 11,768

Totals..... \$121,135,159 \$125,633,124 I. \$4,497,965

Treasury deposits with national banks amounted to \$97,297,516, showing an increase of \$48,278 as compared with the corresponding day last week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending March 23d, give the following totals, comparison being made with the corresponding week in 1900 and 1899:

	1899.	1900.	1901.
Loans and discounts.....	\$779,481,000	\$739,331,000	\$910,779,100
Deposits.....	902,250,700	800,116,400	1,060,458,300
Circulation.....	13,820,800	19,260,700	31,525,100
Reserve:			
Specie.....	190,262,500	146,245,800	185,488,300
Legal tenders.....	53,857,600	59,600,600	71,898,700
Total reserve.....	\$244,120,100	\$205,846,400	\$260,387,000
Legal requirements.....	252,562,675	200,029,100	250,114,575
Balance, surplus....	\$18,557,425	\$5,817,300	\$10,272,425

Changes for the week, this year, were an increase of \$269,825 in surplus reserve; decreases of \$4,033,600 in loans and discounts, \$5,727,300 in deposits, \$60,500 in circulation, \$939,800 in specie, and \$222,200 in legal tenders.

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

Banks.	1900.		1901.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'n.....	\$146,245,800	.....	\$183,488,300	.....
England.....	177,504,151	.....	181,459,585	.....
France.....	387,995,915	\$228,871,530	475,387,700	\$219,575,710
Germany.....	141,885,000	73,095,000	151,045,000	77,810,000
Spain.....	68,329,000	76,205,000	70,100,000	82,330,000
Neth'lands.....	24,860,000	30,420,000	25,292,000	23,103,500
Belgium.....	14,725,000	7,380,000	14,735,000	7,370,000
Italy.....	77,060,000	8,010,000	76,740,000	9,336,500
Russia.....	418,455,000	31,570,000	367,780,000	34,835,000

The returns of the Associated Banks of New York are of date of March 23d and the others are of date of March 22d, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to March 14th, 1901, are reported by Messrs. Pixley & Abell's circular as follows:

	1900.	1901.	Changes.
India.....	£385,727	£1,872,500	I. £1,486,773
China.....	209,229	74,875	D. 134,354
The Straits.....	12,250	48,976	I. 36,726

Totals..... £1,207,206 £1,996,351 I. £789,145
Arrivals for the week, this year, were \$382,000 in bar silver from New York, and £2,000 from Australia; total, £384,000. Shipments were £174,800 in bar silver to Bombay.

Indian exchange remains about the same, at 15.91d. per rupee. The Indian money market is easier and there has been less demand for Council bills in London. Silver is still being bought quietly on Indian account, but in small parcels only.

Other Metals.

Daily Prices of Metals in New York.

March.	Silver.		Copper.				Spelter.	
	Sterling Exchange.	Fine oz. Cts.	Lake, cts. @ lb.	Electrolytic @ lb.	London @ lb.	Tin, cts. @ lb.	Lead cts. @ lb.	N. Y. St. L. cts. @ lb.
23	4.87%	60 1/4	27 1/2	16 3/4	16.35	25 1/2	4.32 1/2	3.85 3.70
25	4.88	60 3/4	27 1/2	16 3/4	16.35	25 1/2	4.32 1/2	3.85 3.70
26	4.88	60 1/4	27 1/2	16 3/4	16.35	25 1/2	4.32 1/2	3.85 3.70
27	4.88 1/4	60 3/4	27 1/2	16 3/4	16.35	25 1/2	4.32 1/2	3.85 3.70
28	4.88 1/4	60 3/4	27 1/2	16 3/4	16.35	25 1/2	4.32 1/2	3.85 3.70
29	4.88 1/4	60 3/4	27 1/2	16 3/4	16.35	25 1/2	4.32 1/2	3.85 3.70

London quotations are per long ton (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—During the week under review the market has ruled very quiet indeed. Manufacturers in this country continue to assume a waiting attitude. The foreign demand, however, is somewhat improved. We quote Lake copper at 16 3/4@17c.; electrolytic in cakes, wirebars and ingots at 16.35@16.45c.; in cathodes at 16.10@16.20c.; casting copper at 16 1/2c.

The market for standard copper in London opened on Monday at £69, advanced on Wednesday to £69 12s. 6d., and the closing quotations are cabled as £69 10s. @ £69 12s. 6d. for both spot and three months.

Refined and manufactured sorts we quote: English tough, £73 5s. @ £74 5s.; best selected, £75 5s. @ £75 15s.; strong sheets, £84; India sheets, £81; yellow metal, 6 1/2d.

Tin has been somewhat more active, and business has become very brisk at advancing prices. At the close we quote Straits tin for prompt shipments at 26 1/4c., May at 26 3/4c.

The foreign market, which opened on Monday at £114 10s., advanced on Tuesday to £115 15s., and on Wednesday to £116. On Thursday it reached £116 5s., and the closing quotations are cabled as £115 15s. @ £115 7s. 6d. for spot and £2 10s. lower for three months.

Lead.—A fair business has again been done at the ruling quotations, which are unchanged at 4.20@4.32 1/2c. St. Louis, 4.32 1/2@4.37 1/2c. New York.

The foreign market has had an upward tendency, the closing quotations being cabled as £13 3s. 9d. @ £13 6s. 3d. for Spanish lead, £13 8s. 9d. @ £13 10s. for English lead.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is firm and fairly active at unchanged prices, 4.22 1/2c. for chemical lead and 4.25c. for refined Missouri. Argentiferous lead holds its own at 4.32 1/2c.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, as follows: The average price of silver during February has been 15.32 reales per ounce. The average price of lead has been 83.37 reales per quintal on wharf, equivalent to a price of £13 10s. 6d. per ton of 2,240 lbs. f. o. b. Cartagena, at an average exchange of 34.46 pesetas to £1. The export of pig lead has been: 1,515,488 kgs. to Marseilles; 934,165 kgs. to Newcastle; 489,000 kgs. to London; being 2,938,653 kgs. in all.

Spelter continues rather dull, and buyers being well covered, are holding off. Prices are unchanged at 3.70c. St. Louis, 3.85c. New York.

The foreign market is somewhat steadier, good ordinaries being quoted at £16 10s., specials 5s. higher.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt report from Cartagena, Spain, that the only exports of zinc ore in February were 2,800 tons blende to Antwerp.

Antimony.—There is no change. We quote Cookson's at 10c.; Hallett's, Hungarian, Italian and U. S. Star at 8 1/2c.

Nickel.—The price continues firm at 50@60c. per lb., according to size and terms of orders.

Platinum.—Consumption continues good and prices are strong. For ingot platinum in large quantities \$18.20 per Troy oz. is quoted in New York. In London a recent quotation gives 75s. per ounce, unmanufactured, and 77s. 6d. @ 80s. for crucibles, etc. This is very nearly on a parity with New York prices.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 2c. per gram.

Quicksilver.—The nominal quotation continues \$51 in New York, but metal can be had for \$48.75 @ \$50 in large lots, with a slightly higher rate named for large orders. San Francisco quotations are 50c. lower than last week, \$47 @ \$47.50 per flask for domestic orders, and \$42.50 @ \$43 for export. The London price is £9 2s. 6d. per flask, with the same price named from second hands.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

	Per lb.	Per lb.
Aluminum, No. 1, 99 1/2 ingots.....	33@37c.	Ferro-Titanium (2%).....
No. 2, 90 1/2 ingots.....	31@34c.	Ferro-tungsten (3%).....
Rolled sheets.....	42c. up	Magnesium.....
Alum-bronze.....	20@23c.	Manganese (over 99%).....
Nickel-alum.....	33@39c.	Manganese Cop (20% Mn).....
Bismuth.....	\$2.25	Manganese Cop (30% Mn).....
Chromium (over 99%).....	1.00	Molybdenum (Best).....
Copper red oxide.....	50c.	Phosphorus.....
Ferro-Molyb'dum (50%).....	\$1.00	American.....
Ferro-Titanium (10%).....	90c.	Tungsten (Best).....

Variations in prices depend chiefly on the size of the order.

LATE NEWS

Cripple Creek—Colorado.

(From Our Special Correspondent.)

Ironclad Mining and Milling Company.—At the annual meeting in Denver recently the old board of directors was re-elected. The reports showed that work was being carried on by 2 lessees. One shaft shows good ore.

Isabella Gold Mining Company.—The quarterly report is considerably more encouraging than those issued recently. A new vein has been opened up in the 3d level south and an ore shoot explored 350 ft., and there is still ore in the heading. Stopes have been started and timbered up for 150 ft. Where this timbering has been done the vein is from 10 to 18 ft. wide. The screenings for the entire length of the vein average 1 1/2 oz. in gold per ton. The coarse rock runs something less. Much higher assays have been obtained from sample streaks. The 4th level has not been run, but work is being pushed on the 5th. An increased flow of water was encountered before the station was finished at the 14th level, which has considerably hindered the work, though the pumps are now in place. Prospecting on the Cheyenne vein which has yielded such rich ore will be carried on as rapidly as possible. Nothing is said about the 13th level except that it is dry. A drift is being run to cut the ore recently opened by the lessee, Wrockloff, of the Acacia Company. This will be cut 150 ft. below, where the ore is opened up. In running this drift another vein has been encountered which looks promising, though little work has been done on it. Developments during the coming quarter will be watched with interest, especially those on the 14th level, as it is understood that one or more of the veins will be found in the granite on this level.

Stratton's Independence, Limited.—From the reports given out this property has made an excellent showing during the last month or two. It is estimated that during the past 4 months that over \$3,500,000 worth more of ore has been opened than mined, which leaves the ore in sight at about \$6,000,000. It is expected that the output for March will be about 5,000 tons, of the gross value of \$250,000. The output for February was about 4,000 tons. The shaft is now a little past the 1,000-ft. point. The company is at present paying quarterly dividends amounting to \$122,000.

Utah.

(From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week ending March 23d there was sent forward from the several smelters of the State 85 cars, or 3,596,619 lbs., of ore and bullion, made up as follows: Twenty cars, or 829,257 lbs., of silver-lead bullion; 59 cars, or 2,450,470 lbs., of silver-lead ore, and 6 cars, or 316,892 lbs., of copper bullion.

Juab County—Utah.

(From Our Special Correspondent.)

Tintic Shipments.—There were sent forward from the 3 rail points of this district during the week ending March 23d 121 cars of ore, contributed as follows: Centennial-Eureka, 46; Bullion-Beck, 10; Gemini, 6; May Day, 4; Mammoth, 23; Grand Central, 17; Carissa, 5; Tesora, 3; Swansea, 10; Star Consol, 3. Two cars of concentrates and 2 bars of bullion were forwarded from Mammoth Mill.

Summit County—Utah.

(From Our Special Correspondent.)

Park City Shipments.—During the week ending March 23d there was marketed through the Mackintosh Sampler 3,257,340 lbs. of ore and concentrates, which represents the output of the camp. The several contributors were as follows: Silver King, crude ore, 1,268,020 lbs.; Daly West, crude ore, 746,380 lbs.; concentrates, 743,050 lbs.; Anchor, concentrates, 411,170 lbs.; California, concentrates, 88,720 lbs.

Washington County—Utah.

(From Our Special Correspondent.)

Dixie.—This mine has consigned a 60,000-lb. car of copper bullion to its owners, the St. George Copper Mining Company, at Salt Lake City. The lowest workings, on 450 level, show a 4-ft. face of high-grade copper ore. The smelter will be put into commission about April 1st, and will run steadily.

SLATE TRADE REVIEW.

New York. Mar. 29.

The heavy export movement in January has added materially to the roofing slate shipments for the present quarter; in fact, so far the movement is fully 20% greater than last year. School slates and blackboards, on the other hand, show a falling off, due partly to the smaller export trade, which is the result of the prohibitive ocean freight rates. Doubtless the summer trade will regain some of the markets. Already manufacturers look forward to this demand, and inquiries are coming in more and more.

In New Jersey the Newton slate quarries are doing a good business.

Exports are less, though Pen Argyl, Pa., quarries report some large orders for roofing slate for British markets.

MINING STOCKS.

Complete quotations will be found on pages 419 and 420 of mining stocks listed and dealt in at:

Boston.	Salt Lake.	Montreal.
Colo. Springs.	San Francisco.	London.
Denver.	Spokane.	Mexico.
New York.	St. Louis.	Mexico.
Philadelphia.	Toronto.	Paris.

New York. Mar. 29.

Though the market is quiet prices touched a higher level this week. Amalgamated Copper rose to \$104½, the highest price on record, but sales were few around this figure. On Tuesday, when 29,150 shares were traded in, the price dropped to \$99½, and later it hovered around par. Anaconda Copper went to \$47½, receding to \$45½ on Tuesday, and thereafter sales were made at \$46. The "curb" coppers were stronger, and fair sales are reported. British Columbia brought \$19¼@20; Tennessee, \$18¼@19, and Union, of North Carolina, \$4½.

Ontario, of Utah, after selling up to \$10½ on inside support, receded to 9½ later, but transactions were not large. These prices are the highest in some time. Horn Silver sold at \$1.20. Standard Consolidated is firm, selling at \$4.20, and Brunswick is also higher at \$27c.

Portland, of Cripple Creek, is again up to \$3, Elkton at \$1.75 and Isabella at 76c. Small Hopes, of Leadville, made a sale at 75c. and Breece at \$1.50.

Auction sales were 25 preferred shares Lanyon Zinc Company at \$11 per share.

A seat was sold on the New York Stock Exchange at \$52,000, which is the highest price on record.

The International Zinc troubles are being well aired through the daily press, and the promoters are getting pretty badly handled. Special stockholders' meetings are frequently held in New York, and in order to reorganize the company a 1% assessment on the par value of the stock has been called so as to clear the title to the Free Coinage Mine, the only asset of value.

It is said that fully \$26,000 were paid in dividends by the concern, which probably came from the sale of stock at 75c.@\$1.25 per share, and not from earnings from the property. Since few of the stockholders are rich, it looks doubtful whether they will pay many more assessments, notwithstanding the promises of those who really mean to put the company on a profit-paying basis.

Chas. F. Stewart, of New York City, has brought action against John G. Lyman, Charles S. Hartwell and the company, and the New York Supreme Court has issued a writ of attachment, and the personal profits of Dr. Lyman, his office effects, etc., have been attached and his office closed.

Stewart alleges that Lyman and Hartwell, who were members of the firm of Joshua Brown & Company, Albert C. Foster and John B. Carmichael, of Omaha, conspired to advance the price of the shares of the company by false reports of its solvency and earnings and the amount and value of its property to cause the public to buy at prices beyond the real value. As the result of false statements made to Barrow, Wade, Guthrie & Company, it is alleged, a report was issued which stated that between March and October, 1899, Joshua Brown & Company had received as earnings from the Free Coinage Mine \$45,833, while the expenses of operating the mine were but \$16,007. Plaintiff says this report was false and that it was known to the defendants to be false. As the result of these misrepresentations, the plaintiff says, he paid \$1,550 for stock in the company which he says is worthless. He sues for this and to recover \$25,000 on an assigned claim of Julius Leszynsky, who received \$25,000 of alleged worthless stock for services in forming the company.

International Zinc Company affairs are progressing toward a settlement. Receiver W. K. Trimble is operating the Blue Wing at a profit, though the Blue Wing is the least valuable of the company's properties on account of the hard character of the ground and the thin ore body. The Mayne lease of 48 acres at Galena is worthless as an asset, as under the terms of the lease it is subject to forfeiture when work is abandoned for 30 days or more and it has been idle

for months. The mill was sold by the officers of the company and has been torn down and moved away. The Free Coinage fee consists of 110 acres close to Joplin, with 2 railroads crossing the ground and every foot of it could be subleased if the ground were drained and a reasonable scale of royalties adopted. It looks as if the Western stockholders would buy the property in and reorganize on their own account if the Eastern stockholders do not join with them.

Boston. Mar. 27.

(From Our Special Correspondent.)

The market, which last week was booming, seemed to have met with a check this week, and there was a general reaction in prices on Monday, while Tuesday was marked by profit-taking and almost a general scramble. To-day is quiet with prices firmer, but the amount of business looks moderate in comparison with some recent days.

This all marks the new conditions which prevail here. It is evident that the parties now in control do not mean that the market should get away from them, and they will put a stop to the rise whenever it goes too far to suit them. Pressure was evidently put on the market this week, and nothing could be done but to give way. It is this kind of thing which is going to keep away from the exchange everyone but the small operator who risks little and takes his petty profit on every small turn. The real speculator will risk a great deal, but he cannot and will not fight a power which can turn the market as it pleases. It is not a straight game.

On to-day's sales, Calumet & Hecla brought \$85; Tamarack, \$338; Copper Range, \$53; Wolverine, \$51½; Baltic, \$44; Isle Royale, \$43; Mohawk, \$32. There were sales of Boston & Montana at \$353, and Butte & Boston at \$100@101. There is nothing beyond the old rumor about the consolidation.

Outside of the Lake, Utah Consolidated sold for \$34½; Bingham, \$24; Old Dominion, \$34½@35.

Centennial-Eureka was quoted at \$32½, while Cochiti hangs around \$9@9½.

In the general list Dominion Coal was quiet at \$38, and New England Gas and Coke at \$12.

The latest flotation here in the way of a gold mine is the Blockhouse Mining Company, Limited, of Nova Scotia, which is offering 4,000 shares for sale at par—\$10. It is an old Nova Scotia gold proposition and seems to be a fair offer; the amount asked for is moderate. The board is mainly a Nova Scotia one, only three Boston names appearing in the list.

It is stated, on what seems to be good authority, that Hayden, Stone & Company have sold out the large blocks of United States Mining and Centennial-Eureka shares which they have been carrying for over a year—in fact ever since the collapse of December, 1899. The United States Mining stock was taken by insiders.

San Francisco. Mar. 23.

(From Our Special Correspondent.)

The mining stock market has followed its usual course this week, with small turns on small dealings. There has been nothing special to excite the exchange and prices have shown little variation.

Some quotations noted are: Consolidated California & Virginia, \$1.70; Caledonia, 75c.; Ophir, 64c.; Silver Hill, 40c.; Mexican, 30c.; Sierra Nevada, 30c.; Hale & Norcross, 13c.; Gould & Curry, 12c.

The Producers' Oil Exchange continues to show a large business. The dealings this week were on a liberal scale and prices were firm, the fluctuations being only moderate.

Among the high-priced producers Hanford sold up to \$100, while San Joaquin was quoted \$11.50 @12; Kern, \$8.50; Peerless, \$8.50; Home, \$4; Sterling, \$2.40@2.50. Some other quotations noted are: Twenty-eight, \$1.50; El Dorado, \$1; Junction, 65c.; Reed Crude, 60c.; Lion, 19c.; Bear Flag, 14c.

At the San Francisco Oil Exchange business was good, the range of prices being about the same. Among the producing companies, sales of Hanford, San Joaquin, Sterling and Home Oil are noted. Among the prospects Petroleum Center was a special favorite, while Four Oil, Lion and Reed Crude were largely dealt in.

London. Mar. 12.

(From Our Special Correspondent.)

The South African section of the London mining stock market has again exhibited a little life, chiefly due to buying from Paris. The long delayed surrender of the Boers seems to be within reasonable distance, and many European speculators are closely following the market in consequence. It is not likely, however, that there will be any considerable movement in the market when this desirable event happens, as the burden of reconstruction of the country in general and the mines in particular will be a very heavy one.

The West African section has continued dull and it has not yet got over the shock caused by Mr. Chamberlain's letter. However, another company has been advertised this week just, as it were, to keep the ball rolling. This is the

Akoko Gold Mines, Limited, and it is an offshoot of the Mansu Wassau Gold Mines, Limited, a parent company recently formed. The chief promoter and vendor appears to be a gentleman hitherto identified with the Venture Corporation. Mr. Edward McCarthy's report is relied on for guarantee of the contents and nature of the mine. The property consists of a multitude of old workings abandoned by the natives and it is stated that there is a good deal of rock left that may pay to work on modern principles.

The publication of the report of the Mysore Gold Mine for 1901 has once again attracted attention to the Indian mines as investments. The total production of gold for the year was valued at £633,000 and the profit was £400,000. Out of this, dividends amounting to 135% on the capital have been paid. This is slightly less than in the previous year, when 140% was paid, and the falling off is due to a falling off in the average value of the ore milled from 1 oz. 11 dwt. to 1 oz. 4 dwt., though on the other hand, the amount of ore and tailings treated increased considerably. There are about two years' reserves of ore in hand and the mine continues to open up in a promising manner. The 10s. shares now stand firm at £5 and very few are obtainable on the market. The American market continues to be very much depressed by the Whitaker-Wright collapse, and the arrangements for a reconstruction of the London & Globe Corporation are still as far off completion as ever. I am informed that the difficulties in the way are far more serious than was anticipated by even the most sceptical critic. At the last meeting Mr. Whitaker Wright announced definitely that the most tangible asset, the Baker Street & Waterloo Electric Railway had been actually disposed of for £500,000 and that the money so received would facilitate the payment of debts and provision of new working capital. My information now is that this statement was quite premature, and that the terms of purchase are by no means settled. Indeed, the chances of disposing of the railway are not at all brilliant. Altogether the future of the Globe and its group gets less hopeful as time goes on.

The report of the Montana Mining Company, operating the Drumlummon Mine, shows that the directors and managers consider that the mine is worked out in depth, and they recommend the purchase of some new property. There is still some ground belonging to the mine that has not yet been explored and it is proposed that the profits of treating the store of low grade ore and tailings shall be devoted to exploring this ground. The directors are now considering another property with a view to purchase. The shareholders are by no means unanimous in their opinions as to the policy of the directors, and there are some of them who think that some thousand pounds more should be spent in following the vein in depth in hopes that something may turn up. These shareholders are in a minority, however, and there is no doubt that the policy of the directors will be supported.

Paris. Mar. 17.

(From Our Special Correspondent.)

There has been again an upward movement in the Transvaal gold stocks, for which no immediate cause is apparent. The buying movement is apparently revived, after a short period when it seemed to have ceased altogether. The reported negotiations for peace do not excite very much attention here, since few believe in their success. It is reported from Johannesburg that the military government will permit shortly the resumption of work at a few mines, but nothing is known about those which will be selected, nor of the conditions under which they will be allowed to work.

The metallurgical shares are still dull and uncertain. It appears that the future of these companies rests largely upon their ability to reduce costs and this can be done only by securing cheaper fuel or by reducing wages—or both. Cheaper coal and coke are to be had only by difficult negotiations, and wage reductions involve strikes, so that the reduced charges are uncertain.

The copper stocks have shown some excitement, and there has been a sharp fall in Rio Tintos, which have sold down to 1,472 fr., a reduction of 56 fr. from the previous week. This has been due rather to the withdrawal of support by Berlin operators than to any change in the position of copper. The other copper shares have also fallen.

A fall in Malfidano stock has also occurred which was partly due to reports of reduced dividends. The stock has been declining for some time past. The prices of zinc and lead have been falling, and the company's costs remain high, owing chiefly to high prices for fuel.

In my last letter I noted the production of coal in France for the past year. We have now the preliminary reports of iron and steel production, the figures being as follows, in metric tons:

	1899.	1900.	Changes.
Pig iron	2,567,388	2,699,494	I. 132,106
Wrought iron	852,756	745,311	D. 107,444
Steel ingots	1,529,182	1,624,048	I. 94,866

The wrought iron production included 621 tons rails, 63,956 tons sheets and 680,735 tons of merchant iron. The steel output includes both Bessemer and open-hearth metal.

The foreign merchandise trade of France for the two months ending February 28th is reported by the Ministry of Commerce as below:

Table with 3 columns: Item, 1900, 1901. Rows include Imports (Fr. 742,155,000 vs Fr. 737,352,000) and Exports (576,454,000 vs 585,150,000).

Excess, imports Fr. 165,701,000 Fr. 152,202,000

The decrease in imports was 4,803,000 fr. and the increase in exports 8,696,000 fr.; leaving a decrease of 13,499,000 fr. in the balance of imports.

The present year promises to be notable for labor disturbances. The strike of the dock workmen at Marseilles, which shows no prospect of an early settlement, is a serious hindrance to commerce. The coal workers are generally in a disturbed state of mind, and strikes are expected. In the iron trade there is discussion of a general reduction of wages, and such a movement will surely be followed by strikes. The prospect in this direction is not a favorable one.

ANNUAL MEETINGS.

Table with 4 columns: Name of Co., Locat'n., Date, Place of Meeting. Lists meetings for various companies like Alice, Ben Butler, Butte & Boston, etc.

*Special Meeting.

DIVIDENDS.

Table with 4 columns: Name of Company, Date, Per share, Total. Lists dividends for companies like Adams, Amalgamated Copper, Amal Copper, etc.

* Monthly. † Quarterly. § Semi-Annually.

ASSESSMENTS.

Table with 6 columns: Name of Company, Location, No., Delinq., Sale, Amt. Lists assessments for companies like Alliance, Alpha Con, Belcher, etc.

STOCK QUOTATIONS.

Table titled 'NEW YORK' with columns for Name of Company, Location, Par value, and stock prices for dates Mar. 22, 23, 25, 26, 27, 28.

Table titled 'SAN FRANCISCO, CAL.' with columns for Name of Company, Location, Par value, and stock prices for dates Mar. 21, 22, 23, 25, 26, 27.

Table titled 'CALIFORNIA OIL STOCKS.' with columns for Name of Company, No. of shares, Par value, and stock prices for dates Mar. 11, 12, 13, 14, 15, 16.

Table titled 'CALIFORNIA OIL STOCKS.' (continued) with columns for Name of Company, No. of shares, Par value, and stock prices for dates Mar. 11, 12, 13, 14, 15, 16.

* Producers' Oil Exchange, San Francisco. Total sales, 71,887 shares.

ST. LOUIS, MO.*

Table with columns for Name, Location, Share capital, Par value, Bid, Ask, and Name, Location, Share capital, Par value, Bid, Ask. Lists stock prices for companies like Am-Nettle, Catharine Lead, etc.

* On Pittsburg, Pa., Exchange. † Ex-Dividend. Total sales, 400,190.

* From our special correspondent.

STOCK QUOTATIONS.

BOSTON, MASS.†

Table of stock quotations for Boston, Mass. listing companies like Adventure Con., Amal. Copper, and others with columns for Par. val., Shares issued, and dates from Mar. 21 to Mar. 27.

COLORADO SPRINGS, COLO. §

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, and others with columns for Par. val., Mar. 18-27, and Sales.

PHILADELPHIA, PA. §

Table of stock quotations for Philadelphia, Pa. listing companies like Am. Alkali, Am. Cement, and others with columns for L'ca-tion, Par. Val., and dates from Mar. 21 to Mar. 27.

SALT LAKE CITY, UTAH.

Mar. 16.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Albion, and others with columns for Stocks, Shares, Par. val., and Bids/Asks.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont. listing companies like Ontario, Golden Star, and others with columns for NAME OF COMPANY, Par. val., and dates from Mar. 16 to Mar. 22.

Colorado Springs Mining Stock Exchange. Total sales, 1,144,071 shares.

MONTREAL, CANADA.*

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, and others with columns for NAME OF COMPANY, Par. val., and Week Mar. 24.

* Montreal Stock Exchange. Total sales, 27,600 shares.

MEXICO.

March 15.

Table of stock quotations for Mexico, listing companies like Durango, Hidalgo, and others with columns for NAME OF COMPANY, No. of shares, Last div'd, and Prices.

STOCK QUOTATIONS.

LONDON. March 15. Table with columns: NAME OF COMPANY, Country, Authorized capital, Par value, Last dividend, Quotations (Buyers, Sellers).

DENVER, COLO. Table with columns: NAME OF COMPANY, Par val., Mar. 18, Mar. 19, Mar. 20, Mar. 21, Mar. 22, Mar. 23, Sales.

Official Quotations Denver Stock Exchange. Total sales, 21,700 shares.

SPOKANE, WASH. Week Mar. 22. Table with columns: NAME OF COMPANY, Par val., B., A., Sales, NAME OF COMPANY, Par val., B., A., Sales.

PARIS. Mar. 14. Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Latest div., Opening, Closing.

DIVIDENDS.

COAL, IRON, OIL, AND INDUSTRIAL COMPANIES.

Large table with columns: Number, Name and Location of Company, Authorized Capital Stock, Shares, Dividends (Paid, Total to Date, Latest), Number, Name and Location of Company, Authorized Capital Stock, Shares, Dividends (Paid, Total to Date, Latest).

This table is corrected up to March 18th. Correspondents are requested to forward changes or additions.

DIVIDENDS.

GOLD, SILVER, COPPER, ZINC, LEAD AND QUICKSILVER COMPANIES.

Table with columns: Number, Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid, Total to Date, Latest Date, Latest Amt.), Number, Name and Location of Company, Authorized Capital Stock, Shares (Issued, Par Val), Dividends (Paid, Total to Date, Latest Date, Latest Amt.).

This table is corrected up to March 18th. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT WHOLESALE PRICES.

Table with multiple columns listing various chemicals and minerals such as Abrasives, Borax, Calcium, Magnesium, Silver, and others, along with their respective prices and units.

THE RARE ELEMENTS.

Table listing prices for rare elements like Barium, Beryllium, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Germanium, Glucium, Indium, Iridium, Lanthanum, Lithium, Magnesium, Molybdenum, Niobium, Osmium, Palladium, Potassium, Radium, Rubidium, Ruthenium, Rutil, Selenium, Strontium, Tantalum, Tellurium, Thallium, Thorium, Titanium, Uranium, Vanadium, and Zirconium.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Feb. 16. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.