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THE deal which has just been consummated whereby the mines of the Cumberland Mining and Smelting Company, of Castle, Montana, are to be taken over by a syndicate closely identified with the Great Northern Railway is important in more ways than one. Not only does it mean the development of the Cumberland property, but of all the mines of the district, as a railway is to be built thither immediately. The lack of cheap transportation facilities is what has retarded the growth of this camp hitherto, the ores being of comparatively low grade in silver. They are rich in lead, however, and the energetic operation of these mines will, without doubt, make itself apparent in the lead statistics of the United States.

THE GOLD MOVEMENT.

The exports of gold from the United States during the month of January amounted to \$246,466 against \$728,246 in the corresponding period of 1890; the exports of silver during the same time were \$2,351,598, against \$1,618,464 in January, 1890. The imports of gold in January were \$552,014, and the imports of silver \$2,351,598, against \$1,397,918 and \$1,618,464, respectively, in January, 1890. During the past month, February, the exports of gold from this country have been much larger than the previous month, quite a strong movement of the yellow metal having set in about the 15th ult.; so far the total exports of gold from New York in this movement have amounted to \$4,280,000, notwithstanding that the rate of exchange has not been high enough to make shipments from this country to Europe profitable. The par of sterling exchange is \$4.86½. The rate of demand sterling bills at which gold can be exported to London without loss is \$4.88½ for bars and \$4.89½ for coin. With exchange at par, \$4.86½, the parties on the other side taking gold pay the freight, insurance and interest out of their own pockets. At any higher rate up to \$4.89½ they pay some portion of these charges as a premium. During the past week the rate of demand sterling bills has ranged between \$4.87½ and \$4.88. The exports of gold during the past month have occasioned no apprehension in financial circles, our gold reserves still being large. It is said that the recent exports have been on account of the Austrian Government, which is endeavoring to increase its stock of gold and is paying a premium for it.

THE PRODUCTION, CONSUMPTION AND STOCKS OF COPPER IN THE UNITED STATES IN 1891.

The Calumet & Hecla Mining Company has still neglected to furnish us with the official statement of its production of copper in 1891, but we have good reason for estimating it at 56,000,000 pounds instead of 65,000,000 pounds, which was the figure that we quoted it at in our Annual Statistical Number. The error was through a transposition of the figures which was confirmed by the known output of mineral of the company during the year. Had this mineral averaged 70 per cent., which is lower than its average in former years, it would have made 65,000,000 pounds, but as a matter of fact the Calumet & Hecla mineral is now running very much lower than it ever did before. This change in the production of this company will make a corresponding change in the output of the Lake Superior mines, which will be 104,370,000 pounds, or 46,594 tons of 2,240 pounds, instead of 115,370,000 pounds, or 51,505 tons of 2,240 pounds, and the total production of the United States 287,620,000 pounds, or 128,402 tons of 2,240 pounds. Adding to this the stocks on hand January 1st, 1891, which amounted to 101,000,000 pounds, or 45,089 tons of 2,240 pounds and the imports of copper in pigs, bars, etc., which according to revised figures amounted to 3,060,000 pounds, or 1,367 tons of 2,240 pounds, the total available supply was 391,680,000 pounds, or 174,858 tons of 2,240 pounds. Deducting from this the exports of copper during the year, which were 114,800,000 pounds, or 51,250 tons of 2,240 pounds, and the stocks on hand December 31st, 1891, which were reported to us as 76,000,000 pounds, or 33,929 tons of 2,240 pounds; the consumption of copper in the United States during 1891 was 200,880,000 pounds, or 89,679 tons of 2,240 pounds, which was an increase of 11,596,000 pounds over 1890.

In a future issue we will refer again to the subject of mining companies furnishing data for the compilation of statistics and the prevention of such errors.

We have received additional reports of the output of some of the principal copper mines of other countries. The product of the Cape Copper Company for eleven months was 4,500 tons of 2,240 pounds. The product of the following mines is for the twelve months of the year, in tons of 2,240 pounds: Mansfeld, Germany, 14,395; Boleo, Mexico, 4,036; Newfoundland (Little Bay), 700; Quebrada, Venezuela, 6,716; Mason & Barry, Portugal, 4,150; and Seville, Spain, 960.

CREEDE, COLORADO.

The ore deposits at the new camp, Creede, in Southern Colorado, have not yet been sufficiently developed to show definitely their geological relations. The Last Chance-Amethyst vein, which is apparently the richest yet opened in the district, is considered to be a fissure in the

trachyte, the prevailing country rock. It has been opened by four shafts, the deepest being down 110 ft., and by drifts along the vein at a depth of 60 ft. for something over 700 ft. These show an ore body averaging $4\frac{1}{2}$ ft. in width, lying between well defined walls. The ore is white and amethystine quartz, barite, and oxides of iron and manganese, carrying native and horn silver. The percentage of quartz is so high that the ore is essentially silicious in character. The remarkable feature of this vein is the solidity of the ore, but a few tons of waste having been taken out in the course of the development work which has so far been done. There are other veins parallel to the Last Chance-Amethyst, but none have yet been opened so extensively.

The Holy Moses mine, on Campbell Mountain, which is one of the most important producers of the camp at the present time, is a vein occurring between trachyte and trap. The walls are well defined in some places, but are much broken in others. The ore contains more manganese and less quartz than the Last Chance-Amethyst, and occasionally pockets of galena are found in it. The Ridge and Ethel mines, also located on Campbell Mountain, show a well-defined vein and ore consisting of galena and waxy blende, with low silver contents. Shipments from these mines have gone about 50 per cent. lead and only five ounces silver, while the Last Chance-Amethyst ore carries no lead and from 50 to 100 oz. silver per ton.

This diversity in character of ore in the same camp and in veins of apparently the same nature is remarkable, though not unusual. Thus the Small Hope's bonanzas at Leadville, Colo., consisted entirely of silicious, silver chloride ore, while the next chute to the east, the immense Morning Star-Maid of Erin chute, was composed of rich lead carbonate ore, of low grade in silver except near the outcrop. Similarly, the Silver Cord Gold ore chute in Iron Hill was distinguished for its gold contents, while the parallel ore chutes on either side did not carry any gold, or but a trifling amount. Chutes in the same fissure vein frequently show such difference in character and frequently maintain their peculiarities with great persistence.

Nothing could show more conclusively the progress of civilization in the West than the sale of the school lands at Creede, belonging to the State of Colorado, which took place last week. These lands, which are located in the heart of that new and promising camp, had been advertised for sale at auction on the 26th ult. but had previously been taken up, for the most part by squatters. As prospecting at Creede is now practically at a standstill on account of the snow the boom in the town has been so far principally in real estate and the disposition of the school lands has been the common topic of discussion. For weeks preceding the sale there have been rumors of trouble when the real estate speculators should attempt to bid up the price of the lots already occupied by squatters. One day last week the press dispatches brought eastward accounts of a general pistol firing at Creede for the purpose of frightening prospective purchasers of the lots and ghastly predictions of gore on the auction day were confidently made. The auction day came and went, however, as peacefully as if it had been in New England, being distinguished only by the natural exuberance which marks men in affairs in the West. But as for "trouble" and "gore" there was none. The fact is that the law is just as paramount now in Colorado as in New England, and this and the railway and the telegraph have put a repetition of the disorderly and exciting times of Virginia City, Deadwood, Leadville and Tombstone entirely out of the question.

In our next issue we shall publish a comprehensive account of the mines and developments at Creede, illustrated from photographs.

THE WORLD'S PRODUCTION OF GOLD.

A study of the statistics and reports from the various parts of the world with respect to the production of gold shows that all fears of a falling off in the yield of the precious metal, so far as the near future is concerned, are groundless. Instead of a diminishing yield all indications point to a considerable increase at no very distant date. Complete statistics of the gold output of the world in 1891 are not yet obtainable, but we have enough data to feel warranted in making the assertion that the aggregate will be considerably greater than that of 1890.

Beginning with the older gold fields of the world, California in all probability made about the same outturn in 1891 as in the previous year, but the mines of Deadwood, South Dak., have made an increase, and there has also, without doubt, been an increase from the silver mines whose ore carries some gold. In our statistical number we estimated that the total production of gold in the United States in 1891 had amounted to \$33,250,000, against \$32,845,000 in 1890, as reported by the Director of the Mint. Australia will in all probability show about the same yield in 1891 as in 1890, for although there has been a falling off in the product of the Mt. Morgan mine, the great gold producer of Queensland, and perhaps also in New South Wales, the returns from Victoria which we have already received show an increase of 37,216 ounces, which will do much to make up for the deficiencies of the other Colonies, which are not in any case likely to be large. The latest statistics from

Russia, those for 1890, which we published in our issue of February 6th, show an increase of over 75,000 ounces over the production of 1889, and, although the returns for '891 have not yet been compiled, it is officially reported that all indications point to another notable increase.

In the Transvaal the year 1891 was a phenomenal one, the output of the Witwatersrandt mines having amounted to 729,223 ounces against 494,801 ounces in 1890. The regularity of the advance in the yield of these mines month by month for the past four years, or since they were first opened, leaves no doubt that their maximum capacity has not yet been reached. Indeed the year 1892 has been commenced by a remarkable increase, the production during the month of January having amounted to 84,560 ounces against 80,312 ounces in December, this having been the greatest output in any one month in the history of the district. The production of the four principal gold mines of Mysore, India, which practically represents the total gold output of that country, was also considerably greater in 1891 than in 1890, amounting to 130,140 ounces against 104,500 ounces. Here, too, the output has shown such a regular expansion during the past three years that it is probable that the climax has not yet been attained and a steadily increasing yield may be expected from this source.

According to the statistics of the Director of the Mint, the United States, Australasia, Russia, Africa and India produced in 1890 a trifle more than 83 per cent. of the total amount of gold produced in the world. In 1891 each of these countries or natural divisions made an increased output, with the possible exception of Australasia, and in the case of Africa, Russia and India the increase was large and important. After a study of these statistics and the reports which are coming from the various mining districts of these countries there is no reason to think otherwise than that they will again increase their output in 1890, even should no new gold fields be discovered.

But there is every reason to expect that new deposits of auriferous gravel and auriferous quartz lodes will be found within the next few years, particularly in the United States, Africa and Siberia, while it is certain that the extensive and rich beds of gravel in Brazil will not remain unworked much longer. The vast expanse of country forming the northwestern portion of the United States has by no means been thoroughly prospected, and new gold mines are constantly being found and opened there. Africa, an unexplored country, bids fair to yield a constantly increasing amount of gold. Pioneers are just going into Mashonaland and Matabeleland, and the reports that are sent out are generally favorable, notwithstanding Lord RANDOLPH CHURCHILL'S strictures. But this is only the beginning of the opening of the Dark Continent. Then there are vast ranges of country in Western and Northwestern Australia which are still *terra incognita*, but from the stories of the few explorers who have been there they seem promising and may revive the waning gold mining industry of that Continent. Eastern Siberia is also a land of great promise, and it is certain that valuable placers will be discovered there. Only within the past month has come news of new gold fields at Nerstchink in the valley of the River Boom, which are said to be rich and have started a rush of prospectors thither. As for Brazil, it is well known that there are immense beds of auriferous gravel there, which can be worked without difficulty. Mr. A. M. GIBSON, a very trustworthy observer, has written an article on the gold fields of that country, which we print elsewhere in this issue. Little time, it must be remembered, is required to make a placer mine productive. No very expensive machinery or costly lines or flumes and ditches are necessary, until easily accessible bars are exhausted and any man can wash gravel with a long tom or a rude system of sluices. Hence when a start is made on any of the placers that are already known in various parts of the world, or which may be discovered, their influence will soon be felt. We do not doubt that the production of gold in the world will show as great an increase in the present decade as it did from 1880 to 1890, when it rose from 160,152 kilos to 174,556 kilos, according to the statistics of the Director of the Mint.

BOOKS RECEIVED.

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

Annual Report of the State Mine Inspector of the State of Missouri for the Year ending June 30th, 1891. By C. C. Woodson, State Mine Inspector. Published by the State, Jefferson City, Mo. Pages, 215. Illustrated.

Directory of the Iron and Steel Works of the United States, and a complete List of the Iron and Steel Works of Canada and Mexico. Compiled and published by the American Iron and Steel Association, Philadelphia, Pa., 1892. Pages, 282. Price, \$4.

Geological Survey of Kentucky: Report on the Occurrence of Petroleum, Natural Gas and Asphalt Rock in Western Kentucky; by Edward Orton. Published by the Geological Survey, Frankfort, Ky., 1892; pp. 233. Illustrated.

History of the Manufacture of Iron in All Ages, and Particularly in the United States from Colonial Times to 1891; also, a Short History of Early Coal Mining in the United States. Second edition. By James W. Swank. Published by the American Iron and Steel Association, Philadelphia, Pa., 1892. Pages, 554. Price, \$7.50.

NEW PUBLICATIONS.

THE MANUAL OF AMERICAN WATER-WORKS, compiled from special returns. M. N. Baker, Ph. B., editor. Pp. 384. Engineering News Publishing Company, New York, publisher. 1892.

This is the third annual issue of this useful manual, containing descriptions of all water-works known to be in operation or under construction July 1, 1891; brief descriptions are also given of such projects as bid fair to develop into works. All the statistical matter has been carried up to as late a date as the compilation and presswork of the manual would permit, extending in general from July to November, 1891. The names of the editor of this volume and its publisher are a guarantee of its reliability.

CATALOGUE OF MINERALS AND SYNONYMS. By T. Egleston, Ph. Pp. 378. John Wiley & Sons, New York, publishers, 1891.

The character of this work is indicated by its title. It is a catalogue of the various mineralogical species with their synonyms. The names of the species have been printed in capitals, those of doubtful species in italics, and those of synonyms in ordinary type. As far as possible the name of the authority of the species has been given. The book is clearly printed in bold type, and the index is so arranged as to be easy for reference. The catalogue has been carefully cross-indexed. It was prepared, Dr. Egleston says, for use in the mineralogical collection of the Columbia School of Mines, and it will no doubt be of value in other mineralogical museums.

THE SCIENTIFIC AMERICAN CYCLOPEDIA OF RECEIPTS, NOTES AND QUERIES. Edited by Albert A. Hopkins. Illustrated by numerous diagrams. Pp. 675. Munn & Co., New York, Publishers, 1892.

This is a compilation in a condensed form of the latest information upon all sorts of topics, such as has been published weekly, for many years, in the columns of "Notes, Queries and Correspondence" of the *Scientific American*. To this, according to the preface, have been made important additions "after laborious researches among the difficult and often inaccessible mysteries known as 'trade secrets.'" The volume can not fail to be useful, the information which it gives being of such varied and practical nature and much of it such as cannot be readily found elsewhere. The subjects treated are a heterogeneous lot and some are discussed at considerable length. Thus 14 p. are devoted to alloys, 37 p. to dyeing, and 14 p. to electro-metallurgy (galvano-plating). The editor has done his work well, but in using such a compilation every reader must, of course, exercise discrimination on his own part.

CORRESPONDENCE.

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

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents

"Outside-Well" Lead Smelting Furnaces.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It would probably interest others beside myself to learn what degree of success has been attained by the "non-crucible" or "outside-well" furnaces for lead smelting adopted by the Philadelphia Smelting and Refining Company, of Pueblo, Colo., and in use at that company's works in March, 1889, according to a letter published in your columns at that date. Will some one who knows kindly state:

- (1) Whether outside wells are still in use at the works mentioned? and
- (2) Whether any other of the large smelters have adopted them lately, and if so, which?

HENRY F. COLLINS, A. R. S. M.

YERRAZAS STATION, CHIHUAHUA, Mex., Feb. 9, 1892.

Nickel-Cobalt Speiss.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Your statistics for 1891 are a splendid testimony to the industry and ability with which you conduct the ENGINEERING AND MINING JOURNAL, and I beg you will allow me to add the expression of my high appreciation of it and those which you must have received from many another subscriber. I will take this opportunity to say that I am a producer, or shall be about Easter, of a speiss or regulus which will contain about 15% of nickel and 6% of cobalt. It appears that America may be the best market for this product. I will thank you to put me in communication with any probable purchasers.

THOMAS RICKARD,

35 QUEEN VICTORIA STREET, LONDON, E. C., Feb. 5, 1892.

The Cost of Producing Copper.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The position which you take in regard to machinery, etc., put on a mine is strictly correct. A very small proportion of any plant put upon a mine or reduction works can be realized from, after the mine suspends operation. If long in use such material can rarely be sold for the price of old iron, while the wood part of all plants is, of course, worthless, except for fuel. Again, machinery of all sorts is made expressly for the uses of the company ordering it and it is seldom found to be fitted for any other. For instance, what company could use the machinery, etc., at Anaconda, if the Anaconda Mining Company should cease operations. The amount of cash that would be realized from any of the plants on the mines throughout the country after the mines are closed would be insignificant compared with its first cost. Ninety per cent. of it in all probability could not be sold at all, and the remaining ten per cent., if sold, would have to go at very low figures.

X. Y. Z.

MONTANA, Feb. 25.

Molybdenum, its Uses and Value.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of January 23d, I find molybdenum quoted at 50 cents per gram in your department "Prices of the Rarer Metals." Will you kindly inform me what this metal is used for?

WARM SPRINGS, Mont., Feb. 3, 1892.

ERICH H. MUSSIGBROD.

[The sole use for molybdenum is in the preparation of molybdates, which are used in analytical chemical laboratories chiefly for the deter-

mination of phosphoric acid. The principal ore of molybdenum is the sulphide, molybdenite, which is a black, lustrous, greasy mineral, in its physical characteristics much resembling graphite or plumbago. The demand for the molybdates is obviously limited, and as for the metal molybdenum, it is made merely as a curiosity; hence the price quoted is a fictitious one. The mineral molybdenite is widely distributed over the world and in some places, as for example among the mountains of Virginia and in the Adirondack region of New York, it is found in very considerable quantities. Indeed, it is said (see "Uses of the rarer Elements," by Prof. Elwyn Waller, ENGINEERING AND MINING JOURNAL May 2, 1891), that if any extended use were found for molybdenum it could be produced as cheaply as, if not more cheaply than, tin.—Ed. E. AND M. J.]

The Profits in Mining.

EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: Seeing the articles entitled "The Profits in Mining" in your issues of January 23d and 30th, I thought it would be of interest to give some facts and figures with respect to the zinc mining industry in the Joplin district. In 1891 there were 237 producing mines here, the majority of them operating single mining lots 200 ft. square. The sales of ore from these mines in 1891 amounted to \$3,919,650; the total amount of capital invested in the land, machinery and improvements by the present owners and operators is \$6,180,000, and the present market value of the same is \$9,467,000. The amount of dividends and royalties (to land owners) paid in 1891 was \$1,567,950, being over 16% on the present market value of the property and over 24% on the capital actually invested.

The foregoing figures are approximately correct; over four-fifths of them being taken from the books of the land companies are absolutely correct, while the others were obtained from the operators and ore buyers, and are below rather than above the actual amounts. The figures of the total amount of capital invested, which I give, are so near the exact amount that they cannot be gainsaid. I base the present market value of this property upon a net return to the owners of 15%, as parties buying developed properties expect to realize that amount on the purchase price, with the probability of increase by the addition of improved machinery and systematic developments. These figures are for the Joplin district only, which embraces the mining camps at Webb City, Cartersville, Zincite and Lehigh, in Missouri, and Galena in Kansas, all within a radius of seven miles from Joplin. The total number of acres in this district is in round numbers 110,000, while but about 9,645 acres are now being mined.

Many of the mines included in the above estimate are new ones and have only been producing for a few months, so that their average for the year was very small. As an illustration of what the older companies do I may cite the Victor Mining Company. It has a capitalization of \$100,000 and paid \$36,000 in dividends last year. The mine owners and operators predict that 1892 will be a prosperous year in this district.

S. B. O.

JOPLIN, Mo., Feb. 8th, 1892.

The Output of the Mines of Hermosa, New Mexico, in 1891.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of January 2d, 1892, appears an article written by Mr. Walter C. Hadley on the ore production of New Mexico, in which he says that Hermosa "has remained in *statu quo*" during the year 1891. He is in error in this for Hermosa, with a population of 230 souls, shipped first-class ore containing 163,000 ozs. silver during that year. The camp is situated 60 miles from the railroad, consequently ores with less than 60 ozs. silver per ton cannot be shipped at a profit. Second class ore is not a small item either. Its aggregate is fully up to the first class in value. The Pelican group produced at least 1,000 tons; the Palomas (Chief the same amount; the Antelope & Ocean Wave another 1,000 tons, and the Homestake 1,000 tons. This ore ranges from 30 oz. to 60 oz. silver per ton. The Pelican group is worked on the tribute system as are also the Antelope & Ocean Wave. The Palomas Chief is worked under the supervision of its owners—men who reside in the camp; they work 10 men continuously and do not pay in promises, but "shell out" the ready cash the first of every month. There has not been a dollar of outside capital expended in the camp, yet its people are prosperous, intelligent and happy. They also realize that Hermosa has not a peer in New Mexico in the steady production of the precious metal. This camp produced more ore in the year 1891 than ever before, and is opening up new and valuable properties. The mines that have come to the front during the year 1891 are the "L", Atlantic Cable, Embolite and Argonaut Consolidated Mines. The Humming Bird is an old property and a good one.

C. B. ROGERS.

HERMOSA, Sierra County, N. M., Feb. 2, 1892.

We submitted this communication to Mr. Hadley and he replies as follows:

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In my report to the Director of the Mint for 1890 I credited Hermosa with 170,000 ozs. silver production. Therefore we must conclude that Mr. C. B. Rogers, your correspondent, does not comprehend the meaning of "*statu quo*" when he objects to my statement that Hermosa remained in that position in 1891, although he only claims 163,000 ozs. silver shipments for 1891. The camp is a most excellent one, but his statement that "Hermosa has not a peer in New Mexico in the steady production of the precious metal" is so entirely wrong as to be positively absurd. There were two mines in other camps, either of which produced more silver. In this connection I am forced to note how much more full and explicit information comes to us *after* the gratuitous work of collecting statistics has been done than *before*, when we seek by all polite and seductive methods to procure statements of output.

WALTER C. HADLEY.

HADLEY, N. M., Feb. 15, 1892.

The Diffusion of Gases.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Air and all other gases, in consequence of the repulsion existing between their molecules, seek to expand into greater volumes, and this tendency is called tension. If a gas be liberated into the atmosphere it will accordingly diffuse itself throughout the space. So, several gases which do not react chemically upon one another will become mechanically mixed, no matter how different their natures or how diverse their relative weights. The law governing the diffusion of gases is most vital-

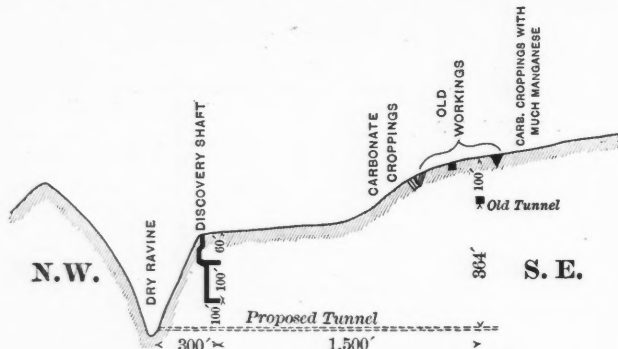
ly concerned with the health and comfort of all beings. Were it not for this property the oxygen and nitrogen of the air we breathe would form two separate layers enveloping the globe, instead of remaining in a constant volumetric ratio of 3:762 to 1.

The explanation of this phenomenon depends upon the mechanical theory of gases. It is not a movement of the entire mass of the gas which takes place, but it is the individual movement of the separate particles which have a free path in the ethereal interstices. The tension of the penetrating gas gives impetus to the movement, while the tension of the medium being entered facilitates the diffusion by offering a larger free path.

Experiments tend to show that all gases do not have the same rate of diffusion, and Dalton presented a theory, which is still accepted, that the ultimate result of diffusion of a gas into atmospheric air is inversely proportional to the square root of its density. This was formulated after experiments upon nitrogen, carbonic acid, marsh gas, etc., and it is easy to understand how molecules of different gases, being of different masses, must move with different degrees of velocity in order to produce the same pressure—that the molecules of a lighter gas can maintain the elastic force only by moving more rapidly than would those of a heavier gas.

Subsequently Graham enunciated a law, so-called, similar to that mentioned, and Bunsen still later followed with an elaborate experimentation. But the results do not agree. The discrepancies are serious. This fact may be explained by the difference in effect of the various membranes separating the two gases, and through which the diffusion was measured. Or it may be due to the small scale on which the experiments were conducted. The experience of the observant mine operator does not always show the behavior of mine gases to be in conformity with the accepted theory; and the numerous anomalies occurring in the process of ventilating mines gives strength to the opinion that our knowledge of this property of gases, so essential to the salubrity of the air and the safety of the mine, is as yet imperfect.

The apparent vagaries in the behavior of fluids have been ascribed to changes of temperature. Heat may increase the absolute velocity of diffusion, but it also increases the volume of the fluid, though not necessarily at the same rate. Now, all gases expand equally with the application of heat, and their densities are equally reduced. So, if Dalton's theory be correct, their relative velocities of diffusion should remain the same for all. The fact that a stagnant volume of firedamp will occasionally rest quietly in a space without diffusing into the current sweeping by it, and is only dislodged by an intense concussion that disturbs its



SECTION ON LINE OF CONTACT.

LOOKING INTO THE GROUND.

very little, is quartz and calcite. The ore is probably oxidized to a considerable depth, as to the northwest the mountain falls off 2,000 ft. in a few miles, and the country rock is quite loose.

Following are a few of the assays made, which are from average samples taken by the writer:

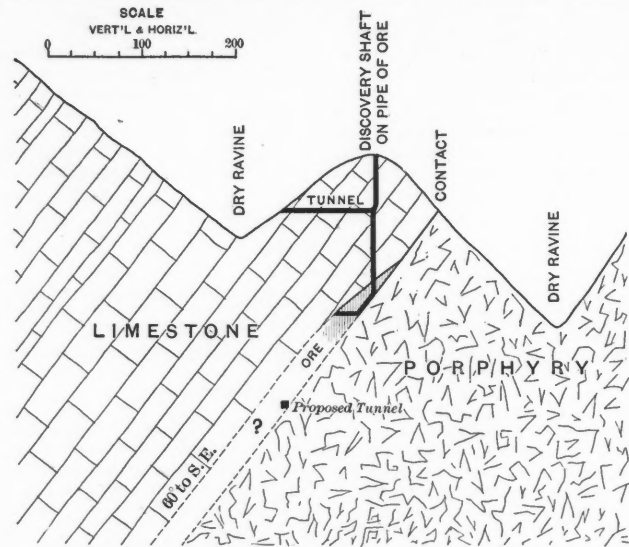
Samples.	Silver, oz. per ton.	Gold. Trace.	Lead. %.
Croppings above old tunnel.....	4½	Trace.	12
Galena lump from bottom of discovery shaft.....	9	"	41
Carbonate lump " " ".....	30	"	50
Sand carbonates " " ".....	8½	"	65
Average of 200 tons of ore extracted from discovery shaft.....	9½	"	48

I think that I can "look far enough into the ground" to predict the existence of an extensive body of lead ore on this property, and were this mine situated in "God's Country" I should have reported favorably, without hesitation, as the average run of ore is of very good quality for fluxing; but where this mine is situated, it would require an average silver content of from 25 to 30 oz. per ton of ore to make it pay, on account of the high cost of transportation.

There is no known mine within 50 miles of this place, but extensive deposits of galena have been worked in this same limestone at that distance to the northwest, and some of them carry as much as 30 oz. of silver to the ton of ore. About the same distance to the east, in the same range of mountains, there are valuable mines of free-milling silver ore, assaying up to 300 oz. and 400 oz. to the ton.

Now, the question I would like to ask of some more experienced miners is: What are the probabilities, under these conditions, of the silver contents of the ore increasing with increased depth?, and I venture to hope that this may provoke a discussion regarding the "probabilities" of ore deposits in general.

I advised the interested parties to run the tunnel proposed, as shown by the accompanying sketches, for a distance of 400 to 500 ft. and note the



CROSS SECTION AT DISCOVERY SHAFT.

equilibrium and sets it into motion, indicates that diffusion is dependent upon the speed of the air current. It has been reported in the papers that the ratio of oxygen and nitrogen at the tops of our Colorado mountains is an abnormal one of 3:624 to 1.

Numerous instances may be cited which require other explanation than that now offered by the theory. True, "exceptions may prove the rule," but a "law" admits of none.

The writer has, for some time past, been studying some of the vagarious manifestations and is now instituting an elaborate series of experiments upon the point in question in an endeavor to ascertain the influence of changes of temperature as well as the effect which the velocity of the medium will have upon the rate of diffusion. He therefore begs of those who are interested in the distribution of knowledge upon this highly important subject, information upon any irregular or anomalous features which have been observed in the ventilation of mines or buildings no matter how insignificant they may seem. Their collation will furnish data for experimentation and they may even suggest the true line of research. For either purpose they will be welcomed.

SCHOOL OF MINES, Golden, Colo., February, 1892.

M. C. IHLENG.

Looking into the Ground.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I note with interest the above entitled article which appeared in your issue of January 23d and have often wished that I could "see beyond the end of my pick" when examining mining properties.

A case in point occurred two or three years ago in an examination I made of a property in Central America. The location is in the Sierra Madre, at an elevation of about 5,000 ft. above sea level. I inclose two sketches showing the formation of the deposit, which is a contact between limestone (probably Sub-carboniferous) and porphyry. The "discovery shaft" was originally sunk on a pipe of ore which came up through the limestone. The "croppings" above this point, along the contact, show a great deal of black oxide of manganese with lead carbonate and some silver. The ore at the bottom of the "discovery shaft," 160 ft. in depth, is 16 ft. in width between the walls, and is composed almost entirely of "sand carbonates," which resemble in appearance those of Leadville interspersed are a few lumps of partially decomposed galena and stains of copper, nickel and cobalt carbonates. The gangue, of which there is

developments, but in view of the low assays, they decided to sink no more money in the scheme.

I would say in addition, that the owners had spent considerable money in the acquisition of the property and in prospecting, on the strength of the report of an English so-called "Mining Expert," who declared this to be a "true fissure lode" and reported assays of the ore as high as 400 ozs. of silver to the ton!! I could find nothing better than is noted above, although many assays were made.

S. M.

CENTRAL AMERICA, Feb. 6th, 1892.

Should We Have a Government Testing Laboratory?

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Allow me to make the following rejoinder to your editorial comment on the proposed Government timber tests:

1. You mislead your readers into believing that the establishment of a Government test laboratory is contemplated. Such is not the case. The laboratory in which the tests have so far been made is fully equipped for the work through the private enterprise of Prof. J. B. Johnson and the Washington University of St. Louis, and will remain in their hands; the tests are made under private contract, and may be finished in three or four years if Congress observe the right economy of appropriating sufficient funds at a time.

Let me here anticipate another specious objection that may arise in the minds of some, namely, that the existing Government test laboratory at Watertown Arsenal should be used. The reasons against this are two—the Watertown machine is fully occupied and no desirable progress could be expected there; it is situated so far from the base of supplies that freight charges would use up funds, while the central location of St. Louis has made it possible to arrange even for free transportation by generous railroad companies, which appreciate the value of the work.

2. Acknowledging the desirability and value of the proposed work, the only objection you raise is that it is not proper work for the Government to undertake.

While I fully agree as to the two negative principles you enunciate for Government enterprise, namely, that it should refrain from work "which is of interest only to a portion of the people," and "which can be conducted by private or by voluntary public enterprise," I contend that these are not the only principles which justify Government enterprise, and fur-

thermore that the two restrictions enunciated by you do not apply in the present case. It is not necessary to point out what other principles I conceive to underlie Government functions in a modern civilized community. I may confine myself to meeting your objection.

Since you do not argue, but only express an opinion, that the proposed test work is not properly Government work, I may, besides my own contrary opinion, cite those of several good authorities on republican principles as well as on engineering matters. Dr. R. W. Raymond, in the ENGINEERING AND MINING JOURNAL, has indorsed the word as a fit object of Government activity. I have over one hundred letters from leading engineers, architects, lumbermen and scientific workers, which also show them as differing from your opinion. To quote the exact language of one, recurring in modified form through all, "it is a work of a kind which cannot be done by any private individual or corporation, and when once done in the manner in which it has now been begun, will be done for all time;" and another: "I can hardly conceive of an expenditure of public money for a better object or for one so likely to return the most valuable results, in which such a large proportion of the citizens of this country are directly and financially interested."

I fear the ENGINEERING AND MINING JOURNAL had not fully realized the object, methods and wide-reaching interest of the results of this work and the difficulties involved when it declared that it was beyond the function of Government because "interesting only a small portion of the people" and "because possible to be done by private enterprise." A little more study of the matter will, I think, make the ENGINEERING AND MINING JOURNAL see that "the very foundation of a free republican Government" and "the self-reliance of the citizen" will not suffer by the increase in important practical knowledge, of benefit to every citizen of the country, which must result from this work in short time, and which, if left to private enterprise, will not be—as it never has been—done at all, leaving us in ignorance, with all the consequences of such ignorance.

To argue this would take more space than I am willing to occupy. I have done so at length in the first bulletin on the timber tests, advance sheets of which I have sent you. But allow me to illustrate rather by a definite example: One series of tests was undertaken to establish the effect of the practice of turpentine gathering upon the strength of the timber of Longleaf pine. The results show that, contrary to accepted public opinion, "boxed" timber from which the resin had been extracted is not of inferior, but, if anything, of greater strength than "unboxed" timber. Does this first definite result of the work benefit only a portion of the community? Only people with small horizons will think so! There are not less than 600,000 acres in the South "boxed" annually, the timber from which, because of the presumed deterioration, cannot find ready market, thus depreciating valuable property over a large section of the country, without reason, to the amount of several million dollars. Worse! because of this presumed inferiority "turpentine lands" are largely left uncut. On account of the resinous condition of the scarred trunks, the fires that sweep through the turpentine orchards destroy not only the trees, but everything of vegetable character on the soil, wiping out the entire resource of timber and of stored fertility, impoverishing and rendering into deserts large tracts in our Southern States, and thereby decimating our national wealth.

Who will maintain that it is not proper republican principle, not Government function, to see whether the depreciation of our resources is unavoidable, whether a loss may not be prevented, which is ultimately felt in the pocket of every taxpayer?

B. E. FERNOW, Chief of Forestry Division.

WASHINGTON, D. C., March 1, 1892.

[We received other letters on this subject too late for insertion this week, and are expecting more. We defer further comment upon the question until a subsequent issue, when the other communications shall have been published.—ED. E. AND M. J.]

GEM MINING IN CEYLON AND BURMAH.

The last few years have witnessed very many efforts made to improve upon the crude methods in use for the mining of the precious stones, says the *Engineer*. When all the gem mining projects in Burmah and Ceylon were first started it was deemed that the results obtained by the native workers in the several fields must be magnified tenfold or more when the scientific methods and machinery of the present day were applied to the fuller development of the mines. In Burmah the much-prized rubies had been chiefly collected from the beds of the rivers, the waters of which had washed, in the course of ages, the valued stones from their matrices. In Ceylon the old method of working was of an entirely different character. Pits were sunk to the depth permitted by the limited pumping appliances available in search of the bed of gravel known as Illian, and when this bed failed to be reached within the limit of possible water clearance the pit had to be abandoned and trial made of one in a fresh direction. It appeared to be a plausible argument that, given the application of machinery adequate to keeping the pits clear of water at almost any depth, the constant enforced abandonment of those sunk would no longer be entailed, and that the profits known to have been made by native workers would be largely increased to the European undertakers.

But the hopes entertained as regarded both Burmah and Ceylon have been doomed to disappointment hitherto; nor would there appear to be any chance of future success unless some improved methods of machine working can be introduced. Conversing on this topic recently with one who had taken an active part in this gem mining enterprise, he remarked to us: "What we want is an honest machine. One that will not only obtain for us the gemmiferous stuff, but will securely guard it from pickers and stealers until it can be raised to the surface and treated under close European supervision." It appears that it is impossible for this last to be given down in the pits of Ceylon, for no European could long endure the heat experienced in them. The authority quoted said further that, as the result of the work undertaken by European mechanical agency in Ceylon, the bazaars of Colombo were fuller than had been ever known before of gems of various kinds, but that few of these had passed through the hands of the several companies working the mines.

The *Levant Herald* states that M. Henrico Mizrahi, a French subject, has obtained a concession to work during a period of 99 years the silver, lead and magnesia deposits discovered at Salonica.

A MIXER AND DIVIDER FOR ORE SAMPLES, AND SMALL SAMPLING MACHINE.*

By H. L. Bridgman.

This apparatus (Fig. 1) entirely obviates the tedious and frequently inaccurate methods—usually with oil cloth and spatula—now in general use, for mixing and dividing the ground samples of ore, matte, slag, and other similar material. An experience of several months has shown a very decided improvement in accuracy, speed, and general convenience over the old way.

The operation is as follows: The ground material is introduced into the large covered funnel (mixer), the outlet being first closed by thumb or finger, as may be most convenient. Funnel and contents are then well shaken for a few minutes, and then, with opened outlet, passed to and fro over the set of distributing funnels (divider) and bottles, as shown. With very finely ground or very light material the flow may be assisted by a slight shaking or tapping with the hand. The little skill necessary is readily acquired.

The mixer will also be found very useful for the prompt and thorough mixing of crucible assay charges and all other work of similar character.

To test the efficiency of the mixer, a lot of 6 assay tons of litharge, 3 assay tons of soda and $\frac{1}{2}$ assay ton of argols was taken, well shaken, divided by weight into three lots of $3\frac{1}{2}$ assay tons each, and these charges fused separately in crucibles. The resulting lead buttons weighed 53,436 gms., 53,416 gms. and 53,398 gms. respectively.

The ore sampling machine shown in Fig. 2 is a modification of the large machine (described in the ENGINEERING AND MINING JOURNAL December 19th, 1891), which is doing excellent work. Its particular field of usefulness is the quick and certain cutting down of the miscellaneous small samples (from 5 lbs. to 500 lbs. in weight) that are constantly being received by all assay offices. It will handle anything from the fines

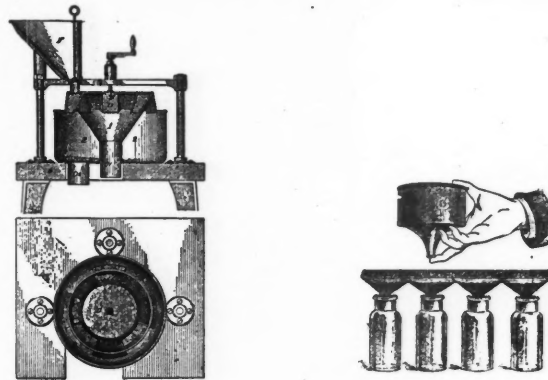


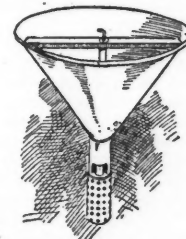
FIG. 2.

assay pulp to crushed material of one half inch or more in size. It is a very decided improvement over any of the present methods of quartering, or cutting down with sample shovel or tin sampler.

In operation, the material is fed either by hand or (with large lots) from a suitably supported bucket into the funnel "F," the divider "D" being first set in rotation by hand, clockwork or any convenient power. The divider gives, as will be seen by inspection of the drawing, eight cuts to the revolution, four being delivered to the funnel 1 and four to the receptacle 2; that is, with uniform flow and speed, cutting the material in half. The divider may easily run 100 revolutions per minute, giving in that time 800 cuts, a very much greater distribution and division than can be secured in any other way. The rejected sample passes down the outlet to "O 2," both into suitable vessels. The retained portion, should it be too large, may be cut again and again, until of suitable size. The operation is very accurate and very rapid, being about as fast as the material will flow through a 1-in. spout.

WEST'S INDICATOR FUNNEL.

R. S. West, of Cleveland, O., is introducing a funnel to be used in filling lamps, cans, jugs, oil stoves, gasoline reservoirs, etc., the advantages of



which are obvious. The funnel is so made that a small aluminum wire will rise when there is sufficient oil in the lamp, and thus may be saved many a spill, as everyone knows from experience.

Use of Sodium Tungstate as a Fixing Agent for Mordants.—The employment of a 15% solution of sodium tungstate is recommended by G. Ulrich for fixing chromium, aluminum, tin, and similar mordants on yarns or fabrics composed of cotton, wool or silk, or of mixtures of two different fibres. The material to be mordanted is impregnated with a solution of chromium acetate, basic aluminum sulphate, etc., and passed through the sodium tungstate bath, which is heated to 30°-40°.

* From *Journal of Analytical and Applied Chemistry*.

THE TEMESCAL TIN MINES.*

By Enoch Knight.

At the present writing, the end of the year 1891, it can be said that the Temescal tin mines, in the hills of that name, that seem to form a detached fragment of the Sierra Madre range, and only eight miles easterly from the Santa Fé station at South Riverside, Cal., have produced the first and only American tin ever sent to the market.

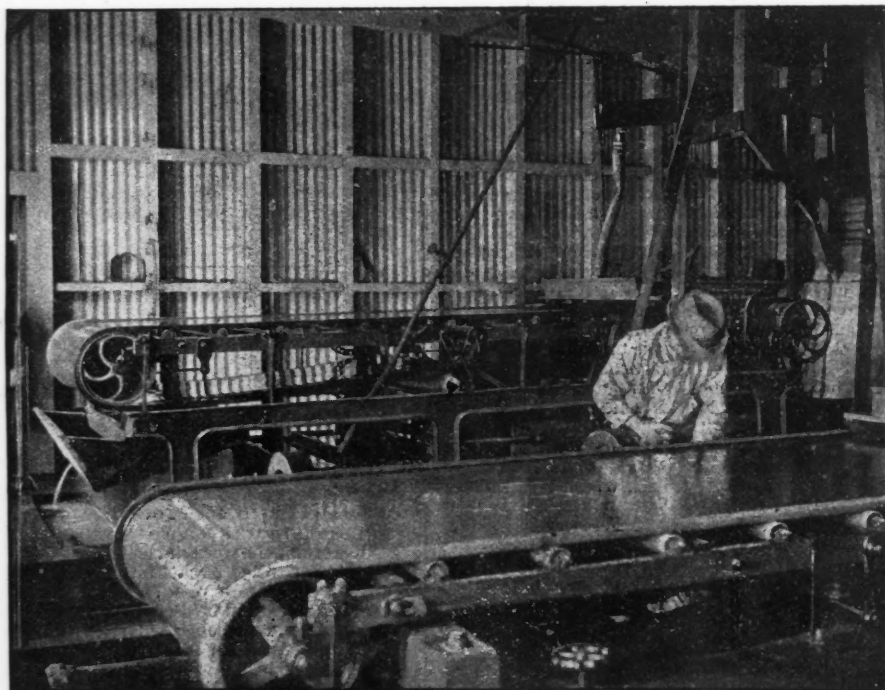
"The San Jacinto Estate, Limited," is the title of the new ownership of the Temescal mines, which for over twenty years after their discovery were tied up in litigation. Colonel E. N. Robinson, through whose efforts most of the developments and improvements have been made, effected a sale of the property to this new English company a year ago last August. By a provision of the transfer it is guaranteed to the former American owners that they may be reinstated in interest again in agreed proportion of ownership by making good certain advances for purchase and development; but the English stockholders are to retain control in any event. It is not undertaken here to state details of the deal, nor is it deemed pertinent to the purpose of this paper. It is a vast property of over 45,000 acres, a considerable portion of which is productive and easily tilled land and has, besides, a valuable water right and showings of gold in one place that will some day be followed up, or rather down. Sir John Stokes, of London, vice-president of the Suez Canal Company, is chairman of the company; Mr. Hugh Stephen, general representative; Mr. E. C. West, engineer, and Captain Stephen Harris, for 40 years a Cornwall mine manager, superintendent of the mining department.

These latter gentlemen have recently been sent out from England and

dential reports of the directors of the company, also of the experts, and given the fullest use of all official information. The amount of ore being daily handled, now that things are working well, is something over 30 tons, and the tin metal product about three-fourths of a ton. Captain Harris assured the company, during his visit to England last summer, that he expected soon to be able to make the mine pay expenses; and he says he is now doing it. The product for December was 25 tons marketed (a little being left over from November); the actual amount smelted was slightly more than 20 tons. He estimates the output of this one lode for 1892 at 250 tons, at the present rate of work and yield of ore. With the third level he expects to get better ore, the present yield being about 4%.

The gross value of a ton of 2,240 lbs. of pig tin, at the highest price yet paid, 23 cents, is \$515. The superintendent's conservative estimate, however, is \$450 a ton; and this year, then, working the ore near the surface and taking into account only this one lode, will, at the lowest estimate, bring to the company, in round numbers, \$112,000. Were it not for the high price of labor and the present rude conditions of manufacturing and marketing the product, there would be a handsome profit in working ore that yields even 4%, that being more than double the yield of the Cornwall mines. The prices for labor are as follows, per day: Engineer, carpenter, etc., \$5; engineman, \$3 25; miners, \$2.75; surface laborers, \$2.25. The miners that work by contract make about \$3. The lowest price paid any man is \$2.25, and this leaves him, after paying his day's board, \$1.50 a day clear. As to imported labor, there are a few Cornish miners, but they have been years in this country, and even if they were to come from England to-morrow they would demand and receive the local market price of labor.

I wish it were possible to make estimates and predictions as to the future



THE CONCENTRATING MILL.

are under instructions to concentrate all their efforts upon the development of the ore bearing lode already opened, the "Cajalco," in which is being led a third level, and preparations made for the most thorough test of the extent and quality of the ore. There are 30 or more lodes, with substantially the same tracings and croppings as this one, and their long black lines stretch across the crests of the low lying sandy hills that form the mining camp, as one has seen weather-beaten fences show their black outlines above wasting snow banks. These lodes are only a few rods apart and can be marked from one out-cropping to another for half a mile even by the unpracticed eye.

Some 20 buildings, neatly kept and planted about with young trees and flowers, make up the camp; and a pretty sight it is, on a December morning, set off against the distant snow mountains whereon winter has placed her sentinel outposts whose helmets glisten like burnished silver in the quivering sun-lit atmosphere. All work upon the property is stopped except the tin mining and the occasional "feeling" of the other lodes, as opportunity offers, it being, as I have said, the policy of the new company to develop this one source and in the meantime to realize as much as possible for the product, the average British stockholder having become somewhat weary, it is said, in contemplating the nebulous nature of many of his recent American investments. The company is so simplifying that the very restaurant has been let to outside parties, who board the hundred and more men for 25 cts. a meal, the company only supplying bunk room.

The fuel used is the lowest grade of soft coal and is hauled 18 miles from Elsinore, the last three miles being over the rude trail that traverses the very pinnacles of the hills, no serious attempt having been yet made to construct easy grades. The coal costs, laid down, \$5.25 per ton. Everything else, also, is necessarily taken over this rude mountain roadway. By and by, no doubt, a short branch railway to the Santa Fé station at South Riverside, about seven miles away, will be built.

The writer, on a recent visit to the mines, was allowed to see the confi-

of the Temescal mines more specific and satisfactory, but I have contented myself with presenting all of the obtainable facts and the best opinions of men, who, it would seem, are entitled to be believed. My own opinion is that the work now being done, and which is bringing in returns that cover the cost of these twenty or more tons a month, will be doubled before another year, and thereafter increased precisely as fast as the new lodes can be advantageously worked; for there are many things to be attended to all the while, like providing a better and cheaper fuel supply, improving the roads and generally lessening cost and waste.

But there is even now an assured American tin mine. There is no doubt about it. It is very easy to work, the ore cropping out so near the surface of these little low-lying hills over and among which one may drive anywhere in a buggy. It is near a great railway, and in the midst of a rich, cultivated country. I cannot learn that any other deposit of tin ore of equal richness and amount has ever been found that could be so easily developed and handled; and I am very positive that the men who have staked reputation and capital upon this venture feel that they have made no mistake.

Production of Pig Iron in Germany.—According to *Industries* the production of pig iron in Germany during the past 12 years has been as follows:

Tons.		Tons.		Tons.	
1880	2,729,038	1884	3,600,612	1888	4,337,428
1881	2,914,069	1886	3,687,433	1889	4,524,556
1882	3,380,806	1887	3,528,636	1890	4,563,009
1883	3,469,719	1887	4,023,953	1891	4,452,011

Coal in Spitzbergen.—A lecture has recently been given before the Berlin Geographical Society by Herr Cremer, on a summer journey to Spitzbergen, where thick beds of coal were discovered. When the party reached the east coast of the Bären Island, on August 7th last year, Herr Cremer found many beds of coal, the thickest being 150 metres. The Spitzbergen coal lies in the Jura and Miocene strata, and looks better than German coal of the same period. Along the coast coal was found in layers about 4½ ft. thick and about 4½ miles long.

*Abstract of an article in the *Overland Monthly*, February, 1892, to which we are also indebted for the accompanying illustrations.

THE MINES OF BRAZIL.

Written for the Engineering and Mining Journal, by A. M. Gibson.

There is no way of ascertaining the mineral production of Brazil, since there are no official statistics. The mining operations are confined to a desultory working of diamond placers in the States of Minas Geraes and Bahia, of moss agate beds in the State of Rio Grande do Sul, the regular mining for gold in Minas Geraes, and the production of a small quantity of charcoal iron at various points in the interior. There is a small output of coal in the States of Santa Catharina and Rio Grande do Sul.

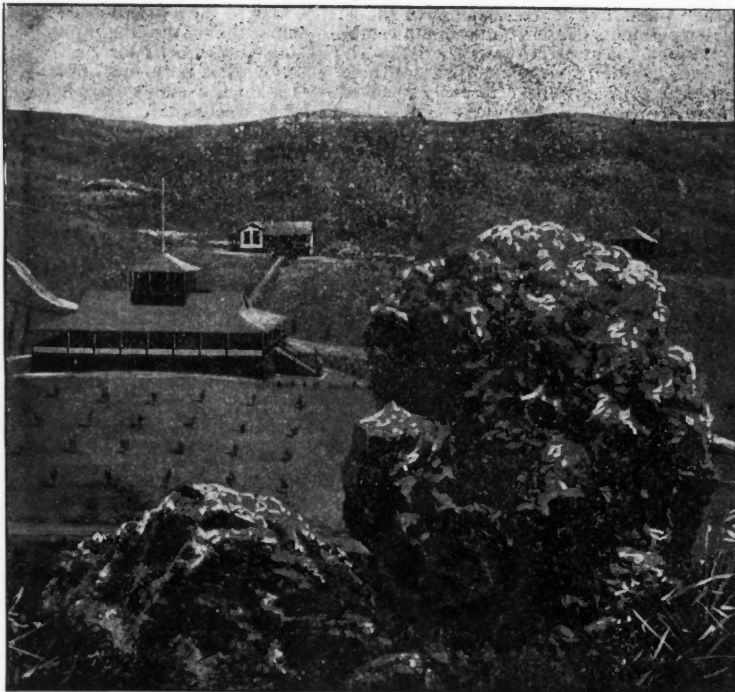
As a mineral country Brazil has few equals, but, except as to gold and diamond mining, its vast natural resources are almost entirely unknown. The Portuguese authorities, more than 200 years ago, stimulated in every possible way search for the precious minerals. In 1770 there was a small yield of gold from placer deposits, which were discovered in the interior, on the head waters of the Rio Jequitinhonha. Other "finds" were made in the same ranges of mountains along water courses, and a vast region of country soon came to be known as Minas Geraes, or general mines. In a very few years after the first discovery of gold on the Rio Jequitinhonha the output of gold in Brazil rose to several millions a year. The work of exploitation was confined exclusively to placer workings.

The conditions under which gold was found in Brazil differed entirely in many respects from those of any other country. Although it has been determined that gold exists here in almost every formation, including sandstone, slate and limestone, in the Laurentian as well as in the Huronian systems, still the latter has been the only one in which persistent sources of supply are found. There were some very rich placers found in the Laurentian, but they were exhausted without the discovery of any persistent veins in the neighborhood. Thus far no quartz lodes of any

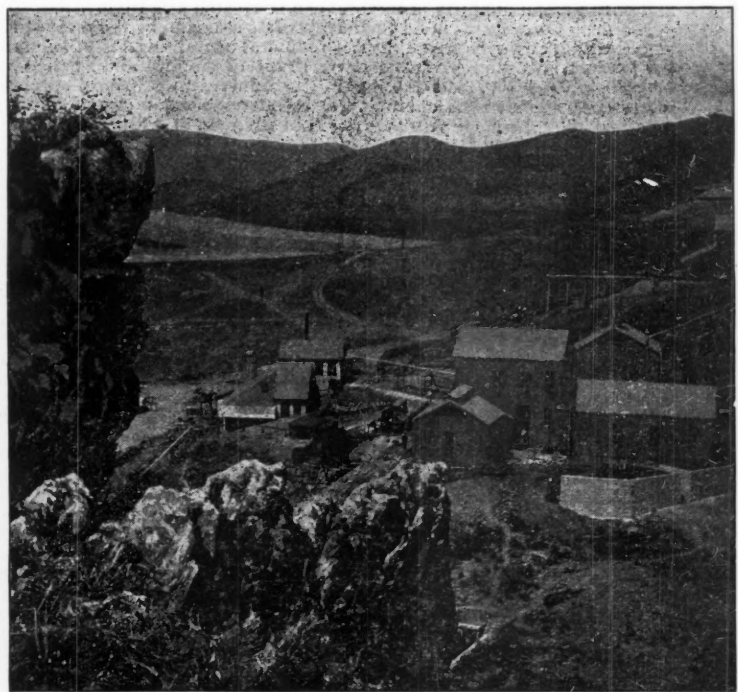
gold. The locality about the city of Ouro Preto, the capital of Minas Geraes, was found very rich in this black gold-bearing gravel, hence the name. The specular iron ore is, as I have said, found also in veins. These veins are true fissure deposits either with granite walls or with slate foot wall and granite or porphyry hanging walls. The general appearance of the vein matter is black with white spots, hence the natives named it *jacutinga*, from two Tupi Indian words: *Jacu*—bird, and *tinga*—white. The game bird of Brazil, corresponding to our quail, is black with white specks and is called by the Indians *jacutinga*.

In this vein matter the gold occurs sometimes free and again both free and in pyrites. The vein matter is soft and easily worked, but the walls have a tendency to close up when the gangue is taken out, and hence heavy timbering is required. The famous Morro Velho mine, the property of the St. John d'el Rey Mining Company, is a *jacutinga* deposit. After having been worked for nearly half a century the mine caved a few years ago and a new shaft is now being sunk. The shareholders were always greedy for dividends and the managers gouged the mine and neglected to timber properly and the cave occurred. There was no reserve fund and the sinking of the new shaft has depended on the collection of assessments. The property, although frightfully mismanaged, has paid during a half century nearly £20,000,000.

There have been in Minas Geraes, the only locality where deep vein mining has been attempted, five wonderful mines out of about thirty which were put on the English market. This is a good showing. Two of these five are still yielding handsomely, and not one of the five has been worked with the most improved appliances nor after modern methods. The free milling ores of Minas Geraes are scarce and the veins small, but the pyrites veins carrying gold are on a grand scale and must some day, with proper appliances and treatment, yield enormously. Dr.



Office Building and Tin Ledge, Cajalco.



Hoisting and Reduction Works from Cajalco Ledge.

THE TEMESCAL TIN MINES.

value have been found in the Laurentian rocks. On the other hand, the Huronian system has proved rich in precious minerals and stones, including various gems besides the diamond.

The peculiarity of the gold placers is their occurrence in a gravel sheet, which is general and conforms to every inequality of the surface of the country. In all other countries the occurrence of placers is limited to stream courses, either along existing waterways or in the dried up or elevated beds of ancient streams. In Brazil there is found everywhere a sheet of gravel and superimposed beds of unstratified clay. This gravel sheet and the superimposed clays Agassiz and Hartt insisted were the result of glacial action. In places, of course, the clays and underlying gravel sheet have been swept away by erosion or denudation, but, except in the Tertiary formation along the coast, there is always abundant evidence to prove that the clay or gravel once existed.

The gravel sheet of course is only auriferous where the rocks are gold bearing; where the Huronian rocks are found this sheet of gravel has very remarkable auriferous persistence. Throughout a great part of Minas Geraes, and in the States of Goyaz, Western Bahia, Maranhao and Matto Grosso, and in a part of Sao Paulo, wherever the Huronian rocks make their appearance on the surface the gold bearing gravel has been found. There is one remarkable species of this gold bearing gravel which is confined to certain localities. It is composed of the disintegrated and weathered remains of specular iron ore. The natives call this kind of gravel *tapanhoacauga*. The specular iron ore in Brazil always carries more or less gold. In Minas Geraes and in Goyaz there are mountains of specular iron ore, and in other localities veins of it are found. The gold occurs both free and in pyrites with the iron. The specular ore sometimes occurs as an overflow and this weakens and breaks up into blocks, which becoming rounded resemble "nigger heads," hence the name *tapanhoacauga*, a word compounded of Congo and Tapi Indian words meaning "nigger head."

When the gravel sheet is largely composed of *tapanhoacauga* the gold is discolored by ferric oxide and the natives call it *ouro preto*—black

Em. Lais, a distinguished French civil and mining engineer, has called attention to the auriferous pyrites veins of Minas Geraes in his book on the "*Climate et Geologie du Bresil*."

The placer mines of Brazil, up to the beginning of this century, yielded over \$2,000,000,000. This enormous sum came from a comparatively small area of the known auriferous regions. The ancient miners, however, "cleaned out" the spots they worked. They had no knowledge of hydraulics—did not know how to construct a long tom, or a rocker, but with the *batea* they took out all there was in the sand and gravel. They had slaves by the thousands and brought water from long distances and at great expense to work the auriferous gravels on ridges and hill-tops. There are doubtless spots in Minas Geraes where rich placers may be found, and in other states there are localities unexplored by white men.

The galena deposits of Brazil have been but little examined—the natives know nothing about galena. Fine specimens come from Minas Geraes, and there are undoubtedly veins of it there, but I can give no particulars. The copper deposits are on a large scale and may prove valuable, but little is known about them beyond vague reports and the rich specimens which have been brought to the National Museum at Rio Janeiro. Asbestos is found in Minas Geraes, and in Goyaz in large deposits, but they have not been worked to any depth, and hence their value can only be guessed at. Plumbago is found in a very pure state, but the extent of the veins is wholly unknown.

There is only one systematic working of diamond ground in Brazil, at Diamantina, in Minas Geraes. The output is small but the stones are of the first water, and the business pays.

Gold Production of Victoria.—The yield of gold in the colony of Victoria during the year 1891 was 621,986 oz., showing an increase of 37,216 oz. over the yield of 1890, which amounted to 584,770 oz.

SULPHUR-MINING IN SICILY.

The mining and fusing of sulphur ore in Sicily has been carried on for a great many years, says Mr. Chas. Heath, U. S. Consul at Catania, Sicily, in a recent report to the State Department, but from lack of enterprise and for want of outside capital, which cannot be induced to invest in any undertaking on the island, the mining and fusing is still carried on in the most primitive fashion. In the majority of mines machinery is unknown, and in the larger and more valuable mines only pumps and hoisting apparatus are used. Hand labor is universal, and a great many children find employment in carrying in baskets on the head the mineral from the mine to the surface.

There are practically four systems of melting sulphur in Sicily—the Calcherone, the Sinopoli furnace, the steam process and Gill's furnace. The first two are most largely used, because it requires little or no capital to fuse in this way. They have a great many disadvantages, however, viz., the fumes kill or ruin all vegetation for miles in the vicinity; the sulphur rock being used for fuel in these processes, a large percentage of sulphur is consequently consumed, besides about 10% is still left in the mineral rock; then the product is not so valuable as in the other processes.

The steam process is a great improvement on the first two, but can only be used where the mineral is very rich and porous. No fumes escape to destroy vegetation, and the product is of a better quality. This process is comprised of large iron tubes filled with mineral into which dry steam is injected.

Official experiments in two of the processes give the following results: Four cu. m. of mineral melted by the steam process have yielded 1,031 kilos of sulphur; 4 cu. m. of mineral melted by the Calcherone process have yielded 932 kilos of sulphur.

Gill's, an English process, has been tried extensively on the island, but, I am now informed, is no longer used, because it requires skilled labor and only a small quantity of mineral can be treated at a time.

The Leon Gil y Ruiz patent Spanish process seems to be the most scientific and to give the best results. With mineral containing 15% of sulphur, the product by Leon Gil's furnace was 12.22% of sulphur and by the Calcherone process 5.6%, thus leaving in the mineral only 3.79% of sulphur, instead of 9.4% by the Calcherone. The estimated cost per day of running a battery of 32 Leon Gil furnaces is: Four firemen, at 2 lire* each, 8 lire; one engine-driver, 4.80 lire; coal, 46.10 lire; oil, 3.75 lire; sundries, 1.35 lire; cleansing steam-boilers, 0.70 lire; repairs, machinery and ventilator, 5 lire; total, 69.70 lire.

Mr. Arthur Verderame, U. S. Consular Agent at Licata, gives the following figures as the mean cost of mining brimstone in Sicily: Mining and hoisting, 33 lire per ton; melting, 8; general expenses, 5; total, 46 lire. To this should be added the government and town dues, reaching as high as 30% of the profits. The transportation to the seaports is made partly by carts and mules and partly by railway. The freight varies according to distance. The shipping expenses have not varied much during the last three years, and are as follows: Cartage from the railway car and storage in warehouses, 0.80 lire per ton; transportation on lighters, 2.10 per ton; customs dues, 12.00; Chamber of Commerce dues, 0.25. The commission of the shipping agent is 1%.

Crude brimstone, as exported to the United States, is divided into seven different qualities, or grades. The difference between two such grades amounts to little more than 30 cts. per ton. Sulphur in Sicily is only refined in Catania. The Sinopoli furnace seems to have given very satisfactory results there. Signor R. Ingria, engineer, gives the following description of this furnace:

The Sinopoli furnace is composed of six or more cells, with vertical walls made of iron plates, into which the mineral is placed. These cases are about 2 m. long, 3 m. high, and 0.25 m. wide, and are placed one upon the other, separated by a space of 12 cm. They are walled within an oven around which are two fireplaces at different levels. The heat enters from the upper part into the above mentioned space of 12 cm., and, passing over the walls of the cells, increases the temperature to the melting point.

After the cells are filled with broken mineral, they are covered with a stratum of wet chalk, with a hole in each box. These holes are used as outlets for the vapors and gases contained in the mineral. Fire is then started, and, after all vapors and gases are allowed to escape, the intensity of the fire is diminished, continuing so for 16 hours. When the fire is out the melted mineral commences to flow off from the front wall of the cell through a hole punctured in its lower part.

About 30 hours are needed for the whole operation. The mineral contained in the six cells ordinarily does not exceed 75 tons, but, by increasing the number of cells and consequently the width of the furnace, the quantity of the mineral increases in proportion.

According to Engineer Matura's experiments, the following results have been obtained: Average yield with the Calcherone system (the old system), 13.5%; average yield with the Sinopoli system, 20%; increase, 6.5%, which, at the price of 8.50 lire per 100 kilos, in the mine, would bring a profit of 2.09 lire, besides the improved quality.

Engineer Matura submitted to the ministry of agriculture, industry, and commerce the following modifications, adapted to the improvement of the above furnace: (1) Two furnaces should be built under the same shed; (2) between the walls joining these two furnaces four *cunicoli* should be constructed, two in the upper and two in the lower part, in order to receive the product of the combustion and to increase the heating surface; (3) the walls should be constructed of cast iron and made with a capacity of two metres each. The cases, as a trial, were made of cast iron, but they did not last long, because after a few operations they were spoiled. The cost of one of these furnaces would amount to 12,000 lire.

BUSINESS METHODS.

The merchants in Sicily make a price, cost and freight, against London bankers' credits. They first get refusal for the quantity desired from the warehouse owners, and, as the freight is an unknown quantity in transactions by cable, the merchants generally claim the option of shipping at any time during 60 days. Some of the principal exporters of Sicilian sulphur are: J. Ritter, Catania; Alonzo & Consoli, Catania; P. Marans, Catania; F. Baller & Co., Messina; E. Fog & Son, Messina; Carlo Wede-

* The lire is equivalent to 19 2/3 cents.

kind & Co., Palermo; Young Bros., Palermo. Sulphur is always shipped from Catania, Licata and Girgenti. The principal shipping merchants are at Catania and Messina.

The Danish Soda Industry.—The erection of several soda manufactories has been decided upon in the Danish provinces, says *Industries*. The contemplated manufacture is that of crystallized and American soda. It is not many years ago that there was only one soda manufactory in Denmark, and at that time a considerable amount of English crystallized soda was imported into Denmark. A change then took place in the soda manufacture; two factories were erected in Copenhagen, one in Elsinore and one in Odense. The import of English soda gradually ceased, and at the same time the home production has grown so as to be undoubtedly sufficient for the home consumption, the two largest manufactories producing about 20,000,000 lbs. annually. In addition to this a Holstein manufactory keeps down the prices by a threatening competition. Should the three contemplated new manufactories really become a reality there will be some difficulty in disposing of the surplus. In Sweden soda manufactories have of late years been erected at Malmö and Helsingborg, and the German manufacturers are protected by tariff; so the two nearest markets are virtually closed.

Uses of Mannesmann Tubes.—A paper was recently read before the Polytechnic Society, of Berlin, on "Developments in the Manufacture of Mannesmann Tubes," by Herr Krause. In the paper the military applications of the tubes were described, such as steel projectiles, ordnance tubes, rifle barrels, steel lances, etc. Reference was also made to the manufacture of carriage poles, telegraph poles and water conduits by this process, and specimens were exhibited showing the bending resistance of the tubes. The demand for tubes to be used in the manufacture of bicycles is already overtaxing the productive capacity of the Berlin branch of the works, says a correspondent of *Industries*. One of the most interesting departments of the Mannesmann establishment is that of the telegraph poles, which is at present very active. The Postal Government for East Africa has ordered large quantities of these poles. Orders for about 7,000 telegraph poles have been recently received for use on the small Asiatic railways, while large supplies are now being sent to Holland. Messrs. Heckmann have introduced the Mannesmann process in connection with the manufacture of brass and copper tubes with good results.

The Gold Production of the Transvaal.—The production of the Witwatersrand mines again increased in January, the output that month being 84,560 oz. gold, against 80,312 oz. in December. The *Johannesburg Star*, in reviewing the past year in its issue of January 9th, says:

The ore does not become intractable at the water level; no depth has yet been attained at which the reefs betray signs of pinching out; the Main Reef, instead of being a white elephant, is being gradually recognized as the corner-stone on which the enduring prosperity of the Randt may with safety be allowed to rest. The notable discovery has likewise been made that results vary, not so much with the relative size and richness of the reefs as with the character of the management which different properties enjoy, and the right men are consequently being emboldened to tackle mines which the wrong men, bringing nothing beyond their inexperience to bear upon the problems in each case presented, could do nothing but discard. With the early advent of railways—unless, indeed, that inevitable boon should be neutralized by the exactions of the Government—there will be a further cheapening of operating costs all round, an addition to the number of big mills, a greater proportion of Main Reef crushed, and an increase in the number of companies venturing to grapple with what are so far regarded as low grade propositions.

The rapid strides made in the Transvaal production of gold promise to continue, and this district promises to have a measurable effect upon the world's supply of this metal. The output in 1892 promises to amount to one-half that of the entire United States. The Witwatersrand district is now really but four years old. For rapidity of development it can be compared to Leadville, Colo., only.

The Westphalian Coal and Coke Trades.—The Westphalian Coke Syndicate held its general meeting on the 28th ult., says *Industries* when it was announced that the coke production of the district in 1891 amounted to 4,388,010 tons, as against 4,187,780 tons in 1890, or an increase of 4.77%. In spite of the increase in production, however, the value has fallen more than \$3,000,000. It was decided at the meeting that the production during the present month (February) should be restricted to the extent of 20%. The following table shows the production of coal, together with the number of workmen employed in the Dortmund district during the last twelve years:

	Tons.	No. of workmen employed.		Tons.	No. of workmen employed.
1880.....	22,495,204	80,152	1886.....	28,497,313	99,538
1881.....	23,644,755	83,330	1887.....	30,150,238	99,534
1882.....	25,873,332	94,554	1888.....	33,223,614	105,428
1883.....	27,863,025	97,564	1889.....	33,855,110	115,489
1884.....	28,400,586	101,013	1890.....	35,469,290	127,794
1885.....	28,970,323	101,685	1891.....	37,398,561	138,601

Owing to the numerous strikes that have taken place, the productive capacity of the workmen has greatly retrograded. In 1888 it was 315 tons per man per year; in 1888, 293 tons; in 1890, 277 tons; and in 1891, 277 tons.

Production of Quicksilver in 1891.—According to the annual metal circular of W. T. Sargent & Co. in the *Journal of the Society of Chemical Industry*, January 30th, 1892, the production of quicksilver by the Austrian mines in 1891 was 15,000 flasks against 14,000 in 1890 and the same amount in 1889. The output of the Italian mines was 10,440 flasks against 12,470 in 1890 and 10,498 in 1889. The output of the Spanish mines was 47,993 flasks against 50,202 in 1890 and 49,778 in 1889. The figures for the Austrian mines are for the 12 months from January 1st to December 31st. The figures for the Spanish and Italian mines are calculated from November to November. The production of the Californian mines in 1891 as given in our issue of February 13th, 1892, was 22,904 flasks against 23,926 flasks in 1890. The four countries already named, with Russia, are the principal producers of quicksilver. There are no statistics concerning the Russian mines later than 1890. In that year they produced about 8,000 flasks against 4,822 flasks in 1889. The figures for 1890 were estimated for the last portion of the year, between November 18th and December 31st. Mexico, Servia and Borneo also produce quicksilver, but no accurate returns are available from the mines in those countries.

THE AMERICAN HIGH SPEED ENGINE.

Economy in the use of steam directly affects the balance sheet. The various devices introduced to attain the highest efficiency have been, practically speaking, in the form of stages; from the old style stationary engine, with common slide valve, the more efficient and economical cut-off valve-engine was evolved. The use of steam expansively was the next step, and at this point the key-note of modern engine practice was struck. First the compound, then the triple expansion, and, finally, the quadruple expansion engine became the medium by which the most energy is transferred from steam to various uses in motive power appliances.

Electricity as it is generally applied and the use of high speed machinery has created a demand for engines that combine in their operation the highest economy, high speed and regularity. The engine which forms the subject of this article is built to cover the demand as stated in the foregoing, and to attain this the manufacturers have produced a motor that is absolutely and distinctively different from any engine of the present time.

Fig. 1 shows the device in detail. The heavy lines represent the working or moving parts, while the phantom or shadow lines represent the stationary parts. The piston ("4" Fig. 1) is in the form of a hemisphere pivoting on the spherical head of the follower pin "18." The piston fits in the cylinder tightly. The cylinder has a circular opening through which projects the stem and piston rod "F," which connects in turn by means of a steel-bushed frictionless roller bearing with the crank disk "53." The piston has a frictionless motion, working on the head of the follower pin. This movement gives the end of the piston rod a circular

motion conforming to the periphery of the crank disk "53." The motion may be more readily understood by the following example: Imagine an ordinary dinner bell with the cup closed and the bell a hemisphere instead of the usual shape. Take hold of the end of the handle incline the bell to a plain surface, and then move the handle in a circle; it will be seen that the periphery of the bell will touch the plane at all points as it rolls gradually. This motion is the one used in this engine, and is derived by using steam on the face of the piston, or, as in example, on the closed face of the bell. Suppose that a cup were put over the bell, which had a hole in it through which the bell handle might extend and this hole large enough to allow of the circular movement of the handle; suppose the face of the bell to be divided in four equal parts, each part having a port to allow steam to enter. It is obvious that if steam is admitted to one quarter of the face, the bell will leave that point in a direct line, but if the end of handle be fixed to a wheel, the bell must roll and the end of the handle must describe the circle prescribed by the wheel. Steam admitted successively at the different ports will force the bell to continue the movement until a full circle is completed and the operation commenced again. In Fig. 1 the parts marked "5" and "6" together with two more partition blades diametrically opposite, divide the piston into four parts; these partitions are shown in Figs. 2 and 3 and are fixed in the cylinder head (Figs. 1, "3"); two of them are broken as shown in Fig. 3 to allow the piston to have a perfect motion. The cylinder is bolted to the steam chest, which, in turn, is supported by the bedplate. The steam admission is by means of pipe C to steam chest and jacket. The opening in the cylinder allows steam to exert a pressure on the piston equal to the pressure on its face; thus, the amount of friction is reduced to a minimum. Steam from the chest is then conducted through the stem of the piston by means of an opening, as shown in Fig. 2, and its admission to the cylinder is regulated by the

valves, Figs. 8 and 9. The piston is bored to receive these valves, which are operated by connection with the crank disk and governor, the governor being of the ordinary centrifugal type and arranged on the back of the crank disk. The valves turn upon their own axis, making one revolution for each revolution of the crank. The steam admission into the valve is shown in Fig. "5" g and its passage indicated by the arrows. The partition in the valve, Fig. "5," separates the live from the exhaust steam. The steam when exhausted passes out through follower pin to exhaust pipe D. The rib shown in Fig. 4, held by two screws, acts as cut-off from the governor. In the piston the four ports are opposite the openings in the valves, and the piston being non-rotatory, the revolutions of the valves successively opens and closes the ports, the amount of opening being regulated by the rib as described and shown in Fig. 4.

The reversing movement is attained by means of a spiral rod which works inside of the valve. The movement of lever at the end of the cylinder from one point to the other causes the valve to reverse completely, and thereby regulates the movement. The connection between the spiral and lever, being a combination of straight line and angle, is made by a ball and socket joint. The entire engine beyond the stuffing box is exposed to steam, and lubrication is unnecessary except for cylinder oil cup and the cup on the outer bearing.

The engine may be run at a speed of 2,500 revolutions per minute, and at this speed there is practically no noise or vibration. The removal of the cylinder head, the pulley, 67, Fig. 1, and the flange, Fig. 1, will allow the entire engine to be withdrawn from the frame. The moving parts, eight in number, being so few the liability to accident is greatly reduced, and each part is so carefully made that duplication may be quickly ac-

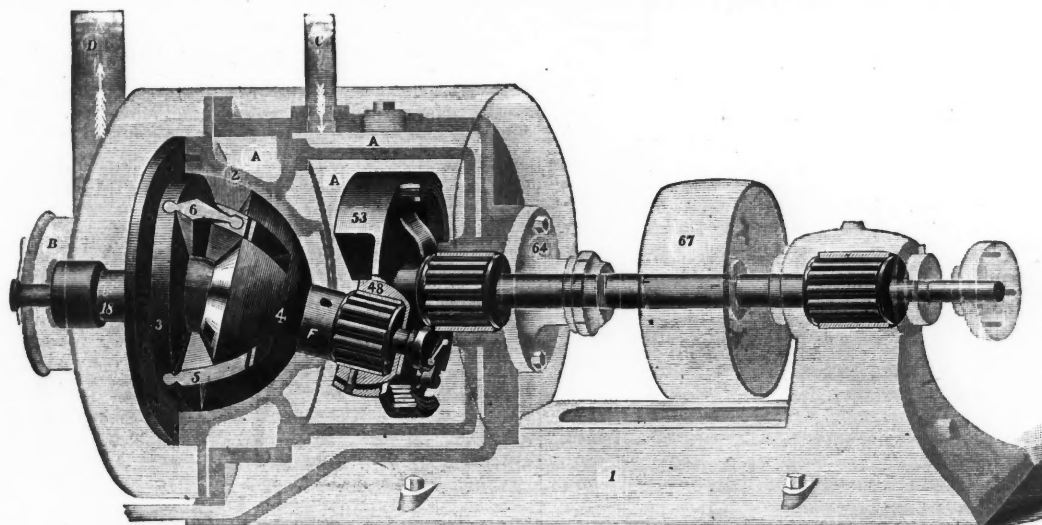


Fig. 1.

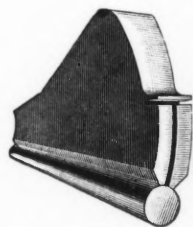


Fig. 2.

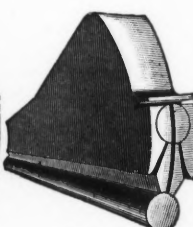


Fig. 3.

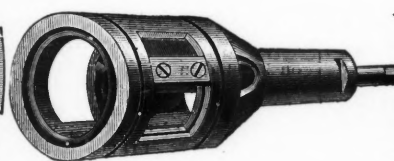


Fig. 4.

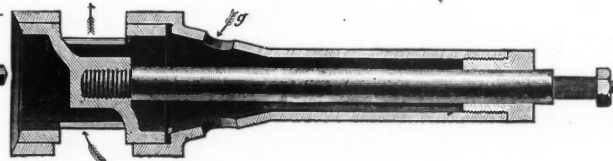


Fig. 5.

THE AMERICAN HIGH SPEED ENGINE.

complished. The engines are built in sizes from 8 H.P. upward. The smallest size cutting off at one-quarter of the stroke with 80 lbs. of steam, will develop 8 H. P. The same engine with 150 lbs. of steam at 2,000 revolutions will give double this amount of power, provided the steam admission be changed; the larger engines are capable of increased power in the same ratio. The engines are built sufficiently strong to allow of this increase of work. In cost this engine is about the same as the best grade of single acting Corliss. The compactness of this motor is one of its most conspicuous features. A 25 H. P. engine being about 5 ft. long, 3 ft. wide and not over 2 ft. in height. The engine is also arranged to run base upward or in a vertical position, and can be coupled direct to shaft. The machine is the invention of Mr. Elmer S. Smith, who has organized the American Engine Company, and built extensive shops at Bound Brook, N. J.

A Method of Nickel Plating.—The following process of nickel-plating trailing wheel parts and similar articles is said to have given excellent results, according to *Iron*. The bath is composed of 1,000 g. of pure nickel sulphate, 750 g. of neutral tartaric acid-ammonia, 5 g. of gallic acid (tannin), and 20 l. of water. The neutral tartaric acid-ammonia is obtained by saturation of a solution of tartaric acid with ammonia. The nickel salt must be neutral. For this purpose the whole is dissolved in 3 to 4 l. of water, and allowed to boil for about a quarter of an hour. Then as much water is added as will produce altogether 20 l. of fluid, which is filtered. The precipitate obtained is very white, soft and uniform, and bears no traces of roughness on the surface. On crude or polished castings very heavy deposits can be obtained, and at a price which scarcely exceeds that of copper plating. Galvanoplastic impressions may also be obtained in this bath. The current need only be weak.

DECISIONS OF THE DEPARTMENT OF THE INTERIOR, AFFECTING THE MINING INDUSTRY.

MINING CLAIM—ADVERSE PROCEEDINGS—WAIVER—DEPARTMENT POWERS.

1. One who files an adverse claim out of time, and subsequently brings suit thereon, but not within the statutory period, does not occupy the status of an "adverse claimant" but that of a mere "protestant," without interest.

2. An adverse claim filed out of time, and subsequent judicial proceedings instituted, based thereon, but not begun within the period prescribed, do not preclude the allowance of a mineral entry; nor does the pendency of such proceedings bar the issuance of a patent on said entry.

3. The failure of an adverse claimant to prosecute his suit in the courts with reasonable diligence, is a waiver of the adverse claim, and warrants the department in proceeding to final action on the claim of the applicant for patent.

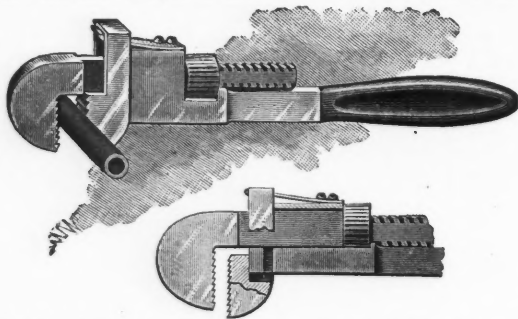
4. If adverse claim, or any claim, is not filed as required, it is not filed at all, in legal contemplation, and the wrongful action of local officers in receiving a claim after period of publication has expired cannot legalize the filing or defeat the operation of the statute in such case, or effect a repeal of its provisions; neither can assent be yielded to the proposition that the jurisdiction of the court in which suit is commenced cannot be questioned by the Department.—*Nettie Lode v. Texas Lode*.—*Appeal from Durango, Colo., Land Office* [Rendered February 16, 1892].

MINERAL LAND—TOWN SITE ENTRY—MINING CLAIM—RECONVEYANCE, ETC.

In case of a patented town site entry for a tract of land containing a valuable mineral vein or deposit which was known to exist prior to the town site application, subsequently it was entered by a mineral claimant. The Department, to obviate judicial proceedings, may accept a reconveyance of the land so erroneously patented, and thus acquire jurisdiction to pass upon the validity of the mineral entry.—*Pederson Lode v. Blackhawk Town site et al.* [Rendered Feb. 16, 1892].

THE RYAN IMPROVED PIPE WRENCH.

This is a tool of simple construction, recently patented by John Ryan, of New York. It has but four parts. The adjusting jaw is arranged with end bar threaded to accommodate the adjusting nut, which fits in socket as shown in the illustration. The inner jaw is arranged to fit over the handle shoulder and is somewhat larger than the shoulder, so that



when a pipe is gripped the jaws are even at the lower edge. The movement of the handle upward gives the inner jaw a slipping movement and the motion downward binds the jaws together and brings the movable jaw back to its place of rest. The jaw is held in its normal position by a spring, as shown in the cut.

The Petroleum Trade in Holland.—The American Petroleum Company of Amsterdam and Rotterdam, an offshoot of the Standard Oil Company, is now organizing the export trade to Holland upon a large scale, by means of capacious tank steamers, especially built for this purpose, says the Amsterdam correspondent of *Industries*. Each steamer will transport about 30,000 barrels of petroleum. With the existing vessels making ten journeys a year, the company transports from North America to Holland an aggregate of 300,000 tons per annum. But this bulk will be materially increased during the coming summer, as soon as the tank steamers, now under construction at Newcastle, shall have been delivered to the owners. They then propose to carry at least 1,000,000 barrels annually across the Atlantic to the principal Dutch ports, a quantity which they deem amply sufficient for the wants of the Continent generally.

A Remarkable Catalogue.—The British Museum authorities have just issued the second volume of a remarkable catalogue, says the *London Standard*. Stored in the drawers and cases of the Museum are some 50,000 inscribed pieces of terra cotta or clay tablets, forming the rescued portions of the great libraries of Assyria and Babylon. The great impetus given to cuneiform studies during the last few years in Germany and America, where they form part of the curriculum for a degree in Semitic languages, has made it necessary that the treasures of the British Museum, the centre of Assyrian studies, should be catalogued, and the trustees have now issued these volumes, containing a descriptive catalogue of some 8,000 inscribed tablets. The inscriptions in question come from the Kuyurik Mound, on the site of ancient Nineveh, which marked the ruins of the great palace and library founded by Assurbanipal, or Sardanapalus, in B. C. 650. The tablets embrace every class of literature, historical documents, hymns, prayers and educational works, such as syllabaries or spelling books and dictionaries. One of the most interesting sections is that of the omen tablets, produced by the court augurs and diviners. They saw omens in all things—the flight of birds, swallows, pigeons, the coiling of snakes, the movements of scorpions, the winds, the clouds, and, above all, the stars. The catalogues have been prepared by Dr. Carl Bezold, are beautifully arranged, and will tend to make the collections more accessible to students, and, in time, better known to the general public, who depend on specialists for the unravelling of the learning and wisdom of Chaldea.

THE USE OF CADMIUM IN ASSAYING GOLD BULLION.*

By Cobell Whitehead.

The use of cadmium as a substitute for silver was first recommended by Balling on account of the property of silver in minute quantities to remain with the gold cornet even after three boilings with nitric acid, necessarily dilute, as lead nitrate, which would be formed, is insoluble to a certain extent in strong nitric acid. The presence of copper to 10% or more makes the accurate determination of silver by cupellation impossible. The method proposed, which has been in use at the Mint Bureau for over a year, has given satisfaction, obviating both sources of error mentioned above.

Five-hundred mgs. of bullion are weighed into a porcelain crucible and covered with 10 gms. of cyanide of potassium and the crucible placed preferably over a blast lamp. When the cyanide is in quiet fusion 1 gm. of cadmium is dropped in; it melts and alloys with the gold. After shaking the crucible is removed and its contents are poured out on a clean porcelain slab. When cool the alloy will be found in one piece easily detachable from the covering of flux.

The alloy is then washed, dried and placed in a diamond mortar, where a few sharp blows quickly reduce it to powder. The powder is transferred to an assay bottle, 1,004 mgs. of pure silver are added, and 10 cc. of nitric acid of 32° Baumé are poured on. When action has ceased the bottle is cooled and 100 cc. of normal salt solution added and the assay proceeded with as usual, accompanied by a proof of 1,004 mgs. of pure silver dissolved in the same amount of acid. The excess of silver found in the proof is the amount contained in 500 mgs. of coin or bullion. It would be possible, however, to determine the silver volumetrically by Vogel's sulphocyanide process.

THE NATIONAL PLUMBERS' AND TINNERS' FURNACE.

Vapor furnaces for plumbers' use have been becoming more common of late on account of their cleanliness and efficiency. The latest invention in this line is being introduced by the National Vapor Stove and Manufacturing Company, of Cleveland, O.

The construction of the stove has some new features. The reservoir is made of steel; a copper hood protects the burner; the burner itself is



constructed in such a form that the entire surface of the irons may be heated instead of the points alone.

The company guarantees that the furnace will melt 10 lbs. of half-and-half solder in 4½ minutes; will heat a 6-lb. copper for use in soldering in 1 minute. The furnace is light, portable and, it is said, perfectly safe, and may be used anywhere that an old style furnace can be used.

DIVIDENDS PAID BY MINING COMPANIES DURING FEBRUARY AND FROM JANUARY 1ST, 1892.

NAME OF COMPANY.	Paid in Feb.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in Feb.	Paid since Jan. 1st.
Adams, Colo.....		\$7,500	Idaho, Cal.....	\$3,100	\$3,100
Alaska, Treadwell.....			Iron Mountain, Mont.....	15,000	15,000
Alaska.....		75,000	Kennedy, Cal.....	15,000	15,000
American-Nettie, Colo.....		15,000	Lexington, Colo.....	3,000	6,000
Argyle, Colo.....		10,000	Maryland Coal, Md.....		42,000
Bald Butte, Mont.....	\$50,000	10,000	Maxfield, Utah.....		9,000
Bannister, Mont.....		6,000	Minnesota Iron, Minn.....		210,000
Best Friend, Colo.....	10,000	20,000	Mollie Gibson, Colo.....	100,000	200,000
Brotherton, Mich.....	20,000	20,000	Morning Star D., Cal.....	7,200	10,800
Bull-Domingo, Colo.....	4,000	4,000	Napa, Cal.....	10,000	10,000
Buxton, S. Dak.....	20,000	20,000	Ontario, Utah.....		150,000
Centennial - Eureka, Utah.....	15,000	30,000	Omaha, Cal.....		3,000
Colorado Central, Colo.....	13,750	13,750	Pacific Coast Borax.....	15,000	30,000
Consolidation Coal, Md.....	205,000	205,000	Pandora, Mont.....		3,000
Colorado Fuel.....	67,120	67,120	Parrott, Mont.....		36,000
Daly, Utah.....	37,500	75,000	Quincy, Mich.....		200,000
Deadwood Terra, S. Dak.....	10,000	20,000	Rescue, S. N., Mex.....	10,000	12,000
De Lamar, Idaho.....		72,000	Rialto, Colo.....	4,500	9,000
Eureka Con., Nev.....		12,500	Rocky Fork Coal, Mont.....	100,000	100,000
Franklin, Mich.....		80,000	Running Lode, Colo.....	5,000	5,000
Golden Reward, S. Dak.....	5,000	10,000	Standard, Cal.....		10,000
Granite Mountain, Mont.....	100,000	200,000	United Verde, Ariz.....		30,000
Hecla Con., Mont.....	15,000	30,000	W. Y. O. D., Cal.....	3,000	6,000
Helena & Frisco, Mont.....		20,000	Yosemite No. 2, Utah.....		5,000
Homestake, S. Dak.....	12,500	\$25,000			
			Total.....	1,156,920	2,168,370

* Abstract of article in the *Journal of the Franklin Institute*

CALCULATION OF SLAG COMPONENTS.*

Written for the Engineering and Mining Journal by George Murray.

From a given set of ores which may be made into combinations such that there may be a division into three or more classes, in No. 1 metallic basic, No. 2 earthy basic, No. 3 acid, it is required to take of each such quantities as combined will give a mixture containing its components in desired proportion.

Let the proposed mixture be such that there shall be *a* FeO metallic bases, *b* CaO earthy bases, and *c* SiO₂ acid components, the whole = 100 lbs., so that the letters may express percentages; from this we have

$$\text{Total FeO} = \frac{a}{c} \text{SiO}_2 \text{ and } \frac{a}{b} \text{CaO.}$$

Take an ordinary example: Let the composition of required slag be 40% FeO, 20% CaO, 40% SiO₂, in the sense above taken, No. (1) as above, 30% FeO, 5% CaO, 20% SiO₂; No. 2, 3% FeO, 50% CaO, 4% SiO₂; No. 3, 6% FeO, 2% CaO, 60% SiO₂, weight of charge to be 1,000 lbs.

Denote quantity of No. 1 by *x*, of No. 2 by *y*, take 100 lbs. of No. 3.

Making the first term of an equation regarding FeO components, the second silicious, we have:

$$.30x + 6 + .03y = (.50y + .05x + 2) \frac{a}{b} \quad \frac{a}{b} = 2.$$

$$x = 4.85y - 10$$

$$.30x + 6 + .03y = (.20x + .04y + 60) \frac{a}{c} \quad \frac{a}{c} = 1.$$

$$x = 540 + .1y = 4.85y - 10$$

$$4.75y = 550, \quad y = 118$$

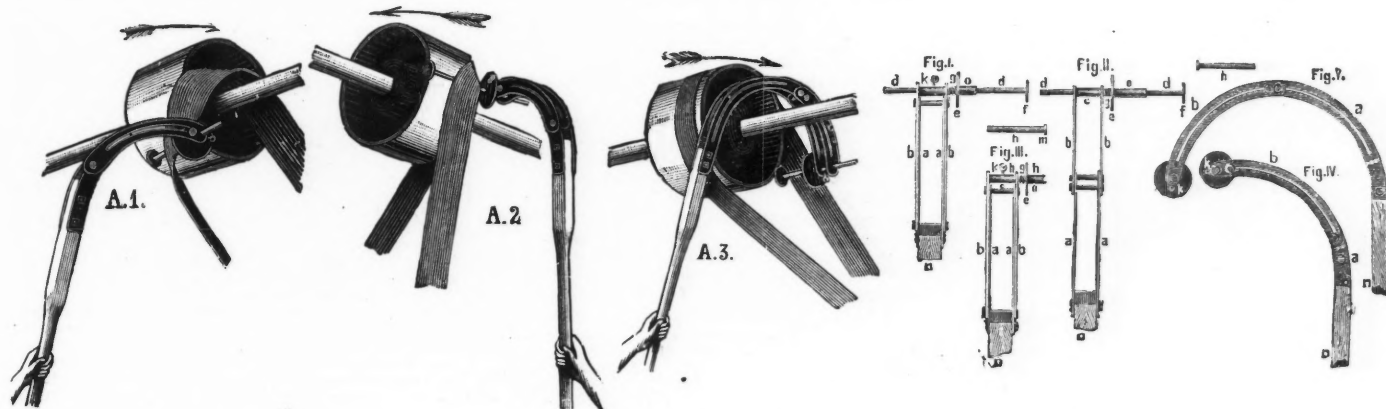
$$x + y + \text{No. 3 ore} = 770$$

$$1,000 + 770 = 1.3.$$

$$118 \times 1.3 = 152; \quad 552 \times 1.3 = 717; \quad 100 \times 1.3 = 130; \quad \text{total, 1,000.}$$

Amounts of FeO, CaO, SiO₂ contained in above are respectively 227, 227, and 114, which relate to each other as required. Their total is partly equal to weight of slag in charge = 568 pounds.

Were the quantities of FeO, CaO, SiO₂ in the generally constant quan-



THE TRIUMPH BELT SHIPPER.

tity of coke used taken in place of those in No. 3 ore, the amounts of *x*, *y* deducted from 1,000, we would have the difference only to obtain in *x*, *y*, and No. 3 ore. On finding these and adding likes to likes, we have the amounts of the components in proportion required.

In practice, the above is not used in its entirety, small percentages of some elements being discarded, and in cases of very constant ore simple factors taking its place altogether.

THE TRIUMPH BELT SHIPPER

In many of the States laws have been enacted which require the use of belt shifters or shifters for doing the work that is necessarily attended with danger when hand or belt pole is used. The accompanying illustrations show a new belt shipper, now being introduced by P. A. Frasse & Co., of New York. The cuts Fig. I., II., III., IV., and V. show the shipper and its construction in detail. By reference to Figs. IV. and V., the most important feature of the device will be seen, that of the expansive head; Fig. IV. shows it closed ready for use as in *a* 1; Fig. V. shows it expanded after throwing on the belt as in *a* 3. Figs. I., II. and III. show the rod and belt flanges. The flanges *f* and *e* hold the belt; *f* slips over the edge of pulley; *e* forces the belt towards the pulley; the flange *e* is arranged with a spiral spring, thus allowing its use for varying sizes of belts; *d* is a removable rod that may be of different lengths to accommodate the use of shifter to large and small belts.

The cuts *a* 1, *a* 2, *a* 3, show the shipper as it appears at different points in using. *a* 1 shows the shipper being introduced under the belt; *a* 2 shows the outer flange caught over edge of pulley, at this point the friction of pulley against the belt draws the belt over and the shipper head expands and finally becomes free as shown in *a* 3. When the device is to be used for belts running the other way, the head is drawn out and the rod introduced on the opposite side of the pulley. The resulting movement is identical with that already described, excepting that the head works by contracting and towards the operator, instead of by expanding and away from him.

The shipper is arranged with a handle which allows the person using it to stand on the floor while operating. This shipper, it is claimed, is

*This article was originally printed in the ENGINEERING AND MINING JOURNAL of August 13th, 1891. As the question which it treats so admirably is one continually coming up before metallurgists, we answer the many inquiries that we have had for it by reprinting the article.—ED. ENG. AND MIN. JOURNAL.

the solution to the trying operation of adjusting a belt at the first trial without danger, and the vexation of spirit attending the work by other means.

A Condensation Hygrometer.—A new condensation hygrometer has been described in the *Comptes Rendus* by Henri Gilbault. In order to determine absolute and relative humidity with a condensation hygrometer, the moment at which dew is deposited must be observed and the temperature of the surface upon which it is formed. Many methods have been proposed to perfect the observation of the moment when the dew appears, but only a few have taken into account the equally important second condition. The author has endeavored to improve existing methods by causing condensation to take place on a thin sheet of platinized glass, and measuring the variations of electrical resistance of the metal. He finds it possible to determine the dewpoint within one-thirtieth of a degree by his method.

Electrical Discharges During Thunderstorms.—At a recent meeting of the Paris Academy of Sciences a paper was read on the influences of electrical discharge during thunderstorms on apparatus registering terrestrial magnetism by M. Em. Marchand. An examination of the tracings drawn by the registering magnetometers at Lyons Observatory since 1837, and the records of thunderstorms, establish a connection between lightning discharge and magnetic disturbances which has been frequently noted. Seventy-three lightning discharges had their time of occurrence and approximate distance recorded during the last five years. Forty of these were accompanied by well-marked disturbances of the declination curve, in fifteen cases the oscillatory movements were slight, but could be easily found when the time of discharge was known; thirteen cases were doubtful, and in five cases absolutely no trace of an abnormal oscillation could be detected. No simple relation appears to exist between the distance of the discharge and the amplitude of the oscillation they produce. Some very violent thunderclaps have only been accompanied by slight magnetic perturbations, while others, far more feeble and distant, have produced very large ones.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, February 23d, 1892.

- 469,225. Brick Machine. Michael Bierline, Chaska, Minn.
- 469,260. Mining Machine. Jonas L. Mitchell, Chicago, Ill., Assignor to the Diamond Prospecting Company, same place.
- 469,269. Process of Smelting and Saving Fumes from Complex Ores. Oliver H. Picher, Joplin, Mo.
- 469,288. Stone Crusher. Eugen Villeroy, Schramberg, Germany.
- 469,334. Pulverizing Mill. Vietts L. Rice, New York, N. Y.
- 469,346. Safety Device for Mining Cages or Elevators. Thomas Fullen, Angel's Camp, Cal.
- 469,399, 469,400. Brick Machine and Mold Sander. John Farnen and John Mulloy, Chicago, Ill.
- 469,439. Apparatus for final concentration of oil of vitriol. Russell S. Penniman, Dover, N. J., Assignor to the Atlantic Dynamite Company, San Francisco, Cal.
- 469,453. Railway tunnel construction. Jesse W. Reno, New York, N. Y.
- 469,464. Process of and apparatus for controlling the discharge of molten contents of crucibles or other vessels. Augustus J. Edgers, Milwaukee, Wis.
- 469,457. Die for forging wrought metal wheels. Archy A. Stevenson, Lewistown, Pa.
- 469,478. Machine for automatically moving coal, etc. William Keenan, Korah, Can.
- 469,493. Rotary Disintegrator and Separator for Fibrous Materials. Berthold Ziegler, Todtnau, Germany.
- 469,497. Derrick. David Crowley, Washington, D. C., Assignor of one-half to Charles K. Nichols, same place.
- 469,538. Process of and Apparatus for Electroplating the Hulls of Vessels. Alexander D. Buchanan, Long Island, N. Y.
- 469,566. Amalgamator. James H. Hawthornthwaite, San Francisco, Cal.
- 469,589. Hydraulic Motor. John W. Pack, San Francisco, Cal.
- 469,593. Method of and Apparatus for Separating Slime or Fines from Water Used in Milling Ores. Albion M. Rouse, Boulder, Colo., Assignor to George R. Williamson, same place.
- 469,608. Coal Mining Machine. James Taylor, Edwards, Ill.

TUESDAY, MARCH 1st, 1892.

- 469,741. Die for Manufacturing Sheet Metal Vessels. Fred W. Judd, Cleveland O., Assignor of one-half to the Avery Stamping Company, same place.
- 469,747. Core Seat for Pipe Flasks. Reese Morgan, Bellevue, Ky.
- 469,841. Apparatus for Raising Sand. Alexander McDougall, Duluth, Minn.
- 469,858. Method of Manufacturing Fuel Gas. William A. Koneman, Chicago, Ill., Assignor to the Chicago Heat Storage Company, same place.
- 469,918. Miner's Safety Lamp. John B. Harris, J. Griffith, and Thomas B. Harris, Wilkes Barre, Pa.
- 470,159. Method of an Apparatus for Reducing Natural or Artificial Bituminous Rock. Henry J. Warren, Buffalo, N. Y.
- 470,168. Earth Auger. Charles A. Scott, Lincoln, Neb.

PERSONALS.

Mr. Robert P. Linderman, president of the Bethlehem Iron Company, left for Mexico last week.

Mr. W. G. Neilson, of Philadelphia, has severed his connection with the Wellman Iron and Steel Company, of Thurlow, Pa.

Mr. W. E. Wolfe, who has been in the office of the Union Ore Sampling Company at Denver, Colo., has resigned his position and accepted one with the Great National Smelting Company at Monterey, Mex.

Mr. E. G. Spilshury, of the Trenton Iron Company, is recovering from the accident which he suffered some weeks since. Mr. Spilshury broke his leg while at Charlottesville, Va., nearly a month ago.

Mr. C. Snelling Robinson, for some years past chief chemist of the Joliet works of the Illinois Steel Company, has accepted the position of blast furnace superintendent of the Dunbar Furnace Company, Dunbar, Pa.

At a meeting of the directors of the Cincinnati Iron Company, at Hurley, Wis., on the 22d ult., the resignation of Horace Williston, secretary and treasurer of the company, was presented and accepted. Frank Cox was elected secretary and M. O. Brooks treasurer.

Mr. G. James Morrison, of Shanghai, China, chairman of the board of directors of the Sheridan & Mendota Consolidated Mining and Milling Company, of Telluride, Colo., is on his way to inspect the workings of the property in order to report to the stockholders.

Mr. George F. Kunz will deliver a lecture entitled "Notes on the Minerals, Gems and Ethnology of the Ural Mountains as Observed During a Recent Trip" before the Mineralogical Section of the New York Academy of Sciences at Hamilton Hall, Columbia College, on the 28th inst., at 8 P. M.

The *Manufacturers' Record*, of Baltimore, Md., was sold on the 29th ult. by the Messrs. Edmonds to Walter H. Page, editor of *The Forum*, of New York, E. H. Sanborn, of Philadelphia, Pa., and Thomas P. Grasty, who has been for nearly three years the chief Southern correspondent of the *Manufacturers' Record*. The *Record* was established nearly ten years ago.

We were in error in our issue of January 23d in stating that Mr. W. J. Olcott had been promoted from the position of superintendent of the Colby mine to that of general manager of the Penokee & Gogebic Development Company, of the Gogebic Range of Michigan and Wisconsin, vice Mr. A. L. Dickerman, resigned. Mr. Olcott was promoted to the position of general superintendent of all the Gogebic Range mines of this company, but Mr. Dickerson continues as general manager of the same.

Mr. B. Mochius, the well known electro-metallurgist of this city, has gone to Germany, where he will build an electrolytic parting plant for the *Deutscher Gold und Silver Scheide Anstalt*, at Frankfurt-am-Main, the largest concern of its kind on the Continent. We are informed that an officer of this company was sent over to the United States recently to inspect the working of the Mochius electrolytic parting process at the works of the Pennsylvania Lead Company, at Mansfield, near Pittsburgh, Pa., and the St. Louis Smelting and Refining Company, at St. Louis, Mo. His report was so strongly in favor of the introduction of this process in Germany that it was decided to install it at the works of the *Deutscher Gold und Silver Scheide Anstalt* in place of the sulphuric acid process heretofore used there. The plant contracted for will have a capacity of treating 30,000 oz. of Doré bullion per day.

The California pioneer longest resident on the Pacific Coast is believed to be Alfred, or Don Alfredo, Robinson, who went out from Boston in July, 1828. He was the clerk of a commercial establishment conducted by Appleton & Co., of Boston, and was one of the protectors of Richard Henry Dana while serving his "two years before the mast." For a time Monterey was Robinson's headquarters, but his business soon required him to visit San Francisco, San Diego and other California missions. He married in 1839 and went back to Boston for a few months. His next trip East was in 1842, when he brought what he believes was the first shipment of gold from California to Philadelphia. In 1848 he entered the service of the Pacific Mail Company, and the following year erected in San Francisco a wooden house which cost \$500 in New York and sold for \$10,000. A large part of Mr. Robinson's work since then has consisted of the management of Don Abel Stearns' estate near Los Angeles.

OBITUARY.

Major-General George W. Cullum died in New York City on the 28th ult., aged 83 years. He was a military engineer of considerable renown and the author of several books bearing on this subject.

George D. Kelly, of Piercé, Kelly & Co., owners

and operators of the Douglass furnaces at Sharpville, Pa., committed suicide on the 24th ult. Mr. Kelly was born in Cleveland in 1843, but has resided at Sharpville for the greater part of his life. He first entered the employ of the late Gen. Jas. Pierce, and since 1870 has been a member of the firm of Pierce, Kelly & Co., which is one of the largest pig iron manufacturing concerns in the Shenango Valley.

William Downie, a pioneer of Sierra County, Cal., and the man after whom Downieville was named, died a few days ago in Oregon, whither he went a number of years since. While he claimed Oregon as his home, he has not had a permanent residence anywhere for a long time. His business was that of a prospector, and during his searching for gold he ranged from Nevada to Alaska. So far as is known his successes have never amounted to much. Major Downie first came into notice during his mining operations on the South Fork in Sierra County, having been previously in Jim Crow Cañon. This was in 1849. He went around the Horn in the ship "Architect," and without losing any time proceeded to the mines. He located a claim at "Hungry Mouth," a short distance above the present town of Downieville, which was called after him. For a while he was very successful, taking out gold in large quantities, but his restless disposition kept him ever on the move, giving up a sure thing for the phantom of something better. This disposition was fatal to many others of that period besides Major Downie. Major Downie was an Englishman by birth, and at the time of his death was upward of 80 years of age.

EXPORT NOTES.

A steamship line has been arranged to run from Portland, Ore., to Vancouver, to connect with the Canadian Pacific railway and steamship line to China and Japan.

The Sicilian exhibition at Palermo, according to press dispatches, is a financial failure. The receipts at the gate were on some days under fifty francs, and many of the exhibitors soon closed up their booths.

Announcement is made that the famous Oroya road, in Peru, built by the American engineer Henry Meigs, has been extended to Port Tucker, and is now complete, bringing an important part of the coast into communication with Callao.

The last run of the steamship "Majestic" which reached New York 24th ult. was the most remarkable one on record, for although the absolute time was a little more than the "Teutonic's" last summer, the rate of speed was greater, the average being 20'41 miles per hour.

The total revenue receipts of Argentina for the year 1891 were \$19,200,000, of which the amount received from customs was \$14,800,000 gold and from sundries \$4,400,000 gold, while the expenses of the various departments of the government, estimated at the same rate of gold, reached a total of \$19,810,000, a deficit of about \$600,000 gold, which is considered a most favorable showing in view of the recent crisis in that country.

According to a dispatch from Washington, D. C., inquiry at the Navy Department develops the fact that the United States is negotiating for about 200 acres of land at Swimming Point and Goat Island, in the harbor of Pago-Pago, Samoa, for coaling and wharf purposes, with every prospect of securing possession. One or two small pieces of land have already been acquired, that is, the titles have been approved by the Attorney-General, but no money has been paid.

WORLD'S FAIR NOTES.

In the Electricity Building there will be 40,000 panes of glass, or more than in any other Exposition structure.

The California building at the Fair will be an imposing structure of the "old mission" type, 110 x 500 ft., with a dome, and costing about \$75,000. It will be surrounded by a hedge of Monterey cypress.

The Manufacturers' Club of Philadelphia desires to erect a building in the Exposition grounds, constructed entirely of material made by members of the club, with intent that it be headquarters for manufacturers, not only of Philadelphia, but of the entire country.

Michigan's building will measure 100 by 140 ft. and be three stories high. It will be constructed of Michigan material, which, with the furnishings, will be donated. Though but \$20,000 of the appropriation will be devoted to its erection, it will in reality be a \$50,000 building.

The governments of Norway and Sweden, respectively, asked for World's Fair appropriations of \$61,288 and \$53,600. In Norway a number of private citizens are raising a fund of \$10,720 with which to build and send to Chicago a counterpart of the Viking ship which was exhumed near Sandefjord few years ago.

W. L. Libby & Sons, of Toledo, intend to erect, on Midway Plaisance, a factory in which the manufacture of cut glass can be seen, from the furnace,

on through the cutting, finishing and decorating departments, until the finished product is turned out. The factory plans call for a structure 125 x 200 ft., of stone, iron and glass, and with imposing dome. The firm intends to spend \$40,000 on the building alone.

Hon. Peter White, of the board of World's Fair managers, of Michigan, has appointed the following committee to look after the exhibit of the Lake Superior copper region: Jay A. Hubbell, Houghton, Chairman; John Duncan Calumet; S. B. Harris, Hancock; Wm. E. Parnell, Red Jacket; F. McM. Stanton, Atlantic; J. H. Moyle, Copper Falls; Ben. Chynoweth, Rockland; Jacob Houghton, Isle Royale; Jas. R. Cooper, Houghton; J. B. Sturgis, Houghton; Edward Ryan, Hancock.

Special World's Fair Commissioner Alexander Campbell has returned from Australasia and reports that great enthusiasm over the exposition is felt in that part of the world. New South Wales, South Australia, Victoria, Queensland, New Zealand, Tasmania, are all making extensive preparations for their representation, and splendid exhibits are reported sure to be sent. Three new steamers between Sydney and San Francisco are about to be put on.

The H. C. Frick Coke Company, Pittsburg, has commenced work on its World's Fair exhibit. The company has been allotted an 80 ft. space at Chicago; 40 ft. of this will be taken up by a working model of the Standard shaft, while in the balance will be shown samples of crushed coke and a topographical chart of the Connellsville region, with the location of the different Frick plants and collieries. The model will be one twenty-fifth the size of the original. It will represent a section of the shaft, tippie, self-acting rams, bins, cages, winding apparatus, engine and boiler houses, with every part of their machinery, workshop, and electric light plant. In addition to these, there will be shown several tenement houses and a block of ovens, with the charging engines, larries, yard railroad track, and freight cars loaded with coke.

The contractors are putting up the steel trusses for the roof of the Manufactures Building. There are 27 main trusses, with a span of 380 ft., and a height of 211 ft. They are 14 ft. wide at the floor and 10 ft. at the apex. These trusses, with the eight smaller gable trusses, weigh 10,800,000 lbs. The main trusses weigh about 350,000 lbs. each, and they are to be raised in position from the floor. To handle these a "traveler" is being constructed on the floor of the building, 50 ft. by 260 ft. and 120 ft. high. On top of this "traveler" will be raised a central tower 135 ft. high, so that the total height of this great lifting arrangement is 255 ft. It will weigh 720,000 lbs., and over half a million feet of lumber will be used in its construction. The floor of the building will not, of course, bear this great weight, and the "traveler" will move on a track specially prepared for it. As much as is necessary of the floor will be torn up and three rows of piles will be driven to support the "traveler." When the work of raising the trusses is finished, this piling will be sawed off and the floor relaid. Another big "traveler" is being rigged on the floor of Machinery Hall to erect the iron work in that structure—a task scarcely less difficult.

INDUSTRIAL NOTES.

The Troy Steel and Iron Company shut down the Bessemer Steel Works at Troy, N. Y., on the night of February 26th. The works will probably be shut down for two or three weeks.

The Lunkenheimer Bros. Manufacturing Company, of Cincinnati, O., is sending to the trade handy calendars for 1892, illustrating the valves which it manufactures, one of which we beg to acknowledge the receipt of.

C. P. Mason, general manager for the Utah & Montana Machinery Company's business in Utah and Montana, has consummated a deal by which the business of the company in Butte, Mont., on March 1, passed into the control of the Tuttle Manufacturing and Supply Company.

The Fort Payne (Ala.) Furnace Company elected the following directors at a recent meeting: R. W. Gordon, C. S. Abbott, J. A. Wilder, G. E. Lathrop, E. D. Freeman, W. A. Jencks, A. H. Layles. The total cost of the furnace to date is \$130,000, and the company has a paid-up capital of \$100,000, with bonds sold to the amount of \$23,600.

Jones & Laughlin, of Pittsburg, Penn., closed down 37 puddling furnaces at their South Side Works on the 27th inst. and discharged 200 workmen. The employes were notified that no definite information could be given as to when a resumption would be made, and that it was to their interests to seek other positions.

The Pittsburg *Commercial Gazette* says: "The erection of a large steel plant at Hammondville, Pa., is under way. The two buildings will be of iron, each 124 ft. by 64 ft., and four smaller buildings will be added soon. The builders and operators are Blackshaw, Boycott & Bayliss, and the product to be turned out will be black plate to be used in making tinplate."

The Finch Manufacturing Company's large iron works in Scranton, Pa., have been purchased by a syndicate with a capital of \$400,000. Among those interested in the purchase are John M. Kemmerer, president of the Scranton Board of Trade; Edward S. Moffatt, manager of the Lackawanna Iron and Steel Company; W. D. Kennedy, Lieutenant Governor L. A. Watres and J. H. Torrey.

Blast Furnace A, of the Pennsylvania Steel Company, at Sparrow's Point, Md., has temporarily suspended operations for repairs. It has been in continual operation since it was blown in on October 23d, 1889, and in the meantime has made about 160,000 tons of Bessemer pig. The work on B furnace is rapidly approaching completion and before many weeks it will probably again be in active service.

The Ingersoll-Sergeant Drill Company, of New York, has issued a new edition (second) of its catalogue No. 3, which forms a volume of 222 large pages. All the appliances manufactured by the company, the well-known percussion drills, air compressors, stone quarrying machinery, coal cutters, electric blasting apparatus, etc., are fully described, and much useful data is given concerning them. A good deal of the excellent compressed air formulae, compiled by Mr. Wm. L. Saunders, C. E., secretary and engineer of the company, is reproduced here, and the catalogue forms, indeed, quite a text-book on mining.

The Bain Electric Manufacturing Company, Chicago, has recently completed a 15 H. P. generator that has some novel features, and is to be used in connection with a mining plant. The generator is slow speed, 165 revolutions, 225 volts, and weighs only 750 lbs. It was wound to run at such slow speed so that it could be coupled up direct, the light weight making it possible to move it easily from one location to another. This company has also just completed a generator, 50 volts, 400 ampères, constant potential, to be used in an experimental electrolytic plant.

At the Illinois Steel Company's meeting on February 10th the officers expressed the belief that the present year will exceed any previous year in the volume of business. The capital stock of this giant corporation is now \$50,000,000. The annual report showed that the net profits were \$1,038,797, against \$2,578,089 in 1890. The profits last year were equal to 5.57% on the outstanding authorized capital, while the profits of 1890 were equal to 11.09%. Total amount of receipts of raw material, 3,025,456 tons; shipped 795,362 tons of finished product; paid in wages during the year, \$5,006,511; average number of men employed, 7,119.

Judge Shipman, of the United States Circuit Court, in New York, handed down his opinion in the suit of the Brush Electric Company against the United States Electric Lighting Company, on the 1st inst. The suit turned on the ownership of what is technically known as the "double carbon lamp." This is a device by means of which the carbons in electric arc lights are fed automatically to the point of contact. The Brush Company claimed the exclusive right to use this device under a patent granted September 2d, 1879. Judge Shipman upholds this claim, and grants a perpetual injunction against the United States Company restraining that corporation from using the "double carbon" in the future. The defendant is also required to appear before United States Commissioner Shields to render an accounting of profits made on the use of the disputed patent in the past two years.

The Tinned-Plate Manufacturers' Association of the United States held a meeting at Pittsburg, Pa., on the 24th ult. The meeting was called to order by J. W. Britton, of Cleveland, chairman, while C. R. Britton, of Cleveland, acted as secretary. The wage schedule was taken up and after considerable discussion a committee was appointed to formulate a wage schedule which shall apply on tin-house labor only, and directed to report at the afternoon session. It was decided that the terms on which tin plates shall be sold to the trade shall be cash 30 days. A committee, consisting of C. R. Britton and W. C. Cronmeyer, was appointed to have full charge of the matter of an exhibit at the Republican Convention at Minneapolis. The question of having a tin plate exhibit at the World's Fair in Chicago in 1893 was also considered. It was the opinion of the members that the time had not yet come to move in this matter, and action on it was deferred until a later date. The Board of Managers was instructed to take up the question as to how the funds necessary to carry on the work of the association shall be contributed. Under the arrangement now existing the initiation fee of \$50 is now charged to each firm that joins the association. It was the sense of the meeting that funds should be raised by levying an assessment on the output of each concern that is a member, and in this way the necessary money can be raised and the amount enlarged. The matter was left in the hands of the board of managers, who will report at the next meeting of the association. The committee to formulate a wage schedule for tin-house labor reported the following wages to be paid: Tin men, 12 cents per box; washmen, 12 cents per box; cradle boys, 4 cents per box; 2 cleaners, 3 cents per box each; dusting, 2½ cents per box, all based

on IC plates, 14 by 20, 112 sheets per box. No other action regarding wages to be paid by tin plate manufacturers will be taken by the Tinned Plate Association, as wages to be paid for the various kinds of labor in sheet mills will be in charge of the Iron and Steel Sheet Manufacturers' Association.

The following is a complete list up to date of the members of the Tinned-Plate Manufacturers' Association of the United States: Norton Brothers, Chicago, Ill.; St. Louis Stamping Company, St. Louis, Mo.; United States Iron and Tin Plate Mfg. Company, Demmler, Pa.; The Britton Rolling Mill Company, Cleveland, O.; Somers Bros., Somerton Tin Plate Works, Brooklyn, N. Y.; Republic Iron Works, Pittsburg, Pa.; The Welsh American Tin Plate Company, Philadelphia, Pa.; W. Dewees Wood Company, McKeesport, Pa.; The Piqua Rolling Mill Company, Piqua, O.; Falcon Iron and Nail Company, Niles, O.; Shoenberger & Co., Pittsburg, Pa.; Marshall Brothers & Co., Philadelphia, Pa.; Bellaire Nail Works, Bellaire, O.; Wellsville Plate and Sheet Iron Company, Wellsville, O.; Aetna Iron and Sheet Company, Bridgeport, O.; The Standard Iron Company, Bridgeport, O.; Alan Wood Company, Philadelphia, Pa.; Sharon Iron Company, Philadelphia, Pa.; McCullough Iron Company, Philadelphia, Pa.; The Pioneer Tin-Plate Company, Joliet, Ill.; Jones & Laughlins, Limited, Pittsburg, Pa.; Jennings Brothers & Co., Pittsburg, Pa.; Summers Brothers & Co., Struthers, O.; The Chartiers Iron and Steel Company, Pittsburg, Pa.; Kirkpatrick & Co., Pittsburg, Pa.; Wm. T. Simpson & Co., Cincinnati, O.; Blairsville Rolling Mill and Tin Plate Company, Blairsville, Pa.; Kieckhefer Brothers & Co., Milwaukee, Wis.; Coates & Co., Baltimore, Md.; Anderson Tin Plate Company, Anderson, Ind.; Columbia Tin Plate Company, Piqua, O.; Wallace, Banfield & Co., Limited, Irondale, O.; American Tin Plate Company, Elwood, Ind.; P. H. Laufman & Co., Limited, Apollo, Pa.; Canonsburg Iron and Steel Company, Pittsburg, Pa.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

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

GOODS WANTED AT HOME.

- 2,586. Boiler, engine and a ginning outfit. Texas.
- 2,587. Metal roofing for a mill house. South Carolina.
- 2,588. A combined planer, matcher and molder; a resaw for siding, with 20-in. saw; also shafting and pulleys. Tennessee.
- 2,590. An engine lathe, 24-in. swing, 8 ft. between centers, and iron planer, 26 in. x 26 in. x 6, and a drill press, 24 in., backgeared. Louisiana.
- 2,592. A machine to separate and grade powdered silica into 4 grades from -80 to 200 mesh. New York.
- 2,593. A good second-hand 50-H. P. tubular boiler, a 35-H. P. engine, and a duplex pump 300 to 500 gallons per minute; must be in good order and stand close inspection. F. O. B. with all fittings. Florida.
- 2,594. A complete outfit for laying asphalt sidewalks and paving streets. Texas.
- 2,595. Barrel and hoop machinery; also a large veneer machine. Florida.
- 2,596. A 10-ft. vertical boring mill, a steam hammer for forging 10-in. shaft, an 18-in. shaper, a 12-in. slotter and an 8-ft. gap rivetting machine. Maryland.
- 2,597. A 24-H. P. stationary engine and boiler to run a flour mill. Virginia.
- 2,599. Machinery for equipping a granite quarry where both water power and electric power is obtainable. Crushed and dimension stone is to be quarried. Virginia.

AMERICAN GOODS WANTED ABROAD.

- 2,582. Catalogues, prices and discounts of pulverizing and conveying machinery. France.
- 2,583. A small sized mill suitable to grind large leaves and stalks to an impalpable powder. The leaves and stalks resemble the tobacco plant and are well dried in an oven before grinding.
- 2,589. Corundum crushers. England.
- 2,591. Complete plant for manufacturing lap and butt welded pipes and tubes. Europe.

2,598. Catalogues, price lists and circulars of refrigerators, coolers, and small ice machines of from 100 to 1,000 lbs. capacity. Central America.

GENERAL MINING NEWS.

STANDARD OIL COMPANY.—The Supreme Court of Ohio, in the case of the State of Ohio ex rel. Attorney General Watson vs. The Standard Oil Company, handed down a decision on the 1st inst. This case was instituted by a petition in quo warranto, to oust the company from its corporate rights and to forfeit its franchise. The judgment of the Court is to oust the company from the right to make the trust agreement set forth in the petition, and of the power to perform the same. This is all the Attorney General desired. He had no animosity toward the company, and did not desire to deprive it of corporate rights as enjoyed by others, but because of trust agreements, which were contrary to law. Under the decision the company will be allowed to continue corporate powers, for which Joseph H. Choate argued in behalf of the company. The decision of the Supreme Court sustains the Attorney General's demurrer to the answer of the Standard, which set up the defense that the trust agreement was entered into by individuals, and not by the company as a corporation holding a franchise. While the decision does not oust the company from its franchise, it prohibits it from in any way continuing to carry out or fulfill any provisions or agreements under trust contracts. The Attorney General of New York has papers ready to file against the Standard in that State, prepared in contemplation of this decision.

S. C. T. Dodd, the solicitor for the Standard Oil Trust, said in an interview with the New York Times, after the above news had been received, said that the decision was an important one, as being the first step toward breaking up the arrangement by which the stocks of the several Standard Oil Companies in different States, and in foreign countries were bound together in the trust agreement. This arrangement, he said, was a matter of business convenience which was in its nature and results different from the popular idea of the functions of a trust. The decision, if followed in other States, would simply terminate this convenient arrangement. The stocks of the various Standard Oil Companies would, of course, still be owned and controlled as at present. The decision in the Ohio court, Mr. Dodd said, he supposed had followed essentially the decision in this State against the Sugar Trust.

The Standard Oil Trust, Mr. Dodd explained, was a trustee agreement by which the various companies known as Standard Oil Companies were controlled by the one board. These companies were engaged in different lines of business. Some were pipe line companies, some were refining and some simply shipping companies. The stocks of all these were owned by the board of trustees, a majority of the stock being held by four men, who thereby controlled the elections in the separate corporations and determined the business policy. In the argument before the Ohio Court, Mr. Dodd said, the trust had admitted that the Ohio corporation had no power to enter into the trust agreement but had maintained that it was an agreement between the individual stockholders and the trustees, in distinction from an agreement between the corporation and the trustees. The Attorney General of Ohio had held that, if the agreement had not been made in the first instance by the corporation, the corporation had ratified it by permitting the stock to be transferred to the trustees. This action, it had been argued by the State, was sufficient to class it an illegal proceeding.

Mr. Dodd reiterated his statement that the trust was simply an arrangement for convenience in doing business and that it would be possible to abrogate the trust agreement and still carry on the business of the Standard Oil Companies as it now is.

He was asked if it would not be possible to organize a corporation under the laws of New Jersey which might exercise the functions of the trust. He said that he did not think the Standard Companies could be advantageously merged into one large corporation.

"Is it true that the Attorney General of New York is prepared to move against the Standard in this State?" Mr. Dodd was asked.

"I have no recent information on that matter," he said. "About one year ago application was made to the Attorney General to begin proceedings here similar to those which resulted in the recent decision in Ohio. In view, however, of the fact that the Ohio case was pending no action was begun here. I have heard nothing of it since that time."

ALABAMA.

CHEROKEE COUNTY.
CEDAR BLUFF LAND, MINING AND MANUFACTURING COMPANY.—This company has leased and will develop the iron mines near Cedar Bluff.

SHELBY COUNTY.
EXCELSIOR COAL COMPANY.—This company is reported as about to open new coal mines at Gurnee.

CALIFORNIA.
AMADOR COUNTY.
KENNEDY MINING COMPANY.—This company, it was disclosed in court recently, paid twelve

monthly dividends of 25 cents each during 1891, a total of \$3 per share. The stock is valued at \$15.

(From our Special Correspondent.)

CLINTON CONSOLIDATED MINING COMPANY.—This property has never been so prosperous as at present. During the past year, eight dividends were declared aggregating \$72,000. A large amount of pay ore is in sight and since September, 1890, an average of 2,000 tons per month has been worked at the 20 stamp mill. There are three quartz veins ranging from 14 ft. to 22 ft. in width, with cross-veins of 4 ft. to 5 ft. wide. Last November a new shaft was sunk and has now reached a depth of 350 ft. It is intended to sink it 1,000 ft., at which depth it is expected the ledges will be cut.

The property consists of 420 acres and some months ago \$165,000 was paid for the Macabo property adjoining, which consisted of 200 acres. A tunnel has been run 700 ft. on the Macabo, opening ledges in slate formation. The 10-stamp mill, operated by water power, is now working on Clinton ore. The company proposes expending \$100,000 in improvements, and when completed the mines will be supplied with three power drills and air compressors and 40 additional stamps added to the mill.

BUTTE COUNTY.

(From our Special Correspondent.)

BUTTE QUEEN MINING COMPANY.—The election of officers, ordered by the court and referred to in these columns a fortnight ago, took place in Judge Trout's court-room on the 15th ult., there being 61,744 shares out of the 99,000 shares of stock represented. The present dissatisfaction has arisen mainly in consequence of the officers having levied an assessment for the purpose of paying themselves salaries from the date of their election. Having exhausted all the money in the treasury for this purpose, they levied another assessment calling for \$4,000 more. Their predecessors in office received no salaries and consequently opposition was at once aroused. By a unanimous vote the objectionable officers were deposed and in their stead the following board elected: H. Powers, H. Francis, E. Mayo, F. W. Spencer and W. C. Lewis, the two last named being retained from the old board. Certificates of election being obtained from the court, the company's affairs have resumed their wonted aspect. None of the stock is on the market and the mine, after considerable expense, is looking promising.

CALAVERAS COUNTY.

UTICA MINING COMPANY.—This company has purchased several adjoining claims, and is proposing, it is said, to increase its crushing facilities.

INYO COUNTY.

INYO MARBLE QUARRY.—This company recently installed a Sullivan channeling machine at its quarry, which has been worked by hand solely hitherto.

MONO COUNTY.

BULWER CONSOLIDATED MINING COMPANY.—The latest official letter from the superintendent says: We extracted from the stopes and put into the main ore chutes 194 cars of ore. The ore body continues large and of good quality. The mill is kept running steadily. Have started an upraise from the northeast drift from No. 4 crosscut on the 200 level in virgin ground. Average battery samples last week, \$36.89 per ton; tailings, \$11.52 per ton.

NEVADA COUNTY.

PROVIDENCE MINING COMPANY.—Fifteen stamps of the 40-stamp mill were started on February 1st.

(From our Special Correspondent.)

NORTH STAR MINING COMPANY.—From January 1st, 1891, to February 6th, 1892, there was hoisted 5,266 cars, or 3,511 tons of ore and waste. The superintendent reports the following rapid sinking from above the 2,300 station to 30 ft. below. From January 6th to February, one Phoenix drill run by four men, working two men per shift of 10 hours each, sunk 55 ft. The shaft is 8 x 10 and is now 2,350 ft. deep with 19 levels turned from it. The maximum length of levels west is over 900 ft., and east over 1,400 ft. The ore is free milling quartz, containing pyrites with traces of galena and blende. The percentage of sulphurets is heavy, about 5% being saved.

PLACER COUNTY.

(From our Special Correspondent.)

EUREKA CONSOLIDATED MINING COMPANY.—After some set-backs and considerable trouble the property of this company is showing to good advantage. The superintendent reports that he has broken through the rim 30 ft. above the floor of the tunnel and the indications all point to a pay channel.

GRAY EAGLE MINING COMPANY.—After years of uphill work the west drift is now showing 6 ft. of rich blue cement while the east drift is showing blue gravel. A ten-stamp mill and electric plant are now to be put in.

SAN BERNARDINO COUNTY.

(From our Special Correspondent.)

CALICO CONSOLIDATED MINING AND MILLING COMPANY.—Three suits have been instituted against this company in the United States Circuit Court. Two are by the Waterloo Mining Company, and the third by the Burning Moscow Mining Company. The Waterloo Company is or-

ganized under the laws of Wisconsin, and owns the Silver King and Red Jacket quartz mines, and the allegation is made that the defendants have extended drifts from Oriental No. 2 and the Mammoth mine, into the Silver King and Red Jacket mines, and from the former taken out 2,500 tons of ore, and from the latter 1,800 tons of ore valued at \$30 per ton. The suits are for \$75,000 and \$54,000 for the ore thus appropriated. The Burning Moscow Company also alleges in the complaint filed that 1,500 tons of ore were extracted by the defendant company by extending a drift from the Mammoth mine into plaintiff's ground, and \$45,000 damages are asked.

SHASTA COUNTY.

(From Our Special Correspondent.)

The Crossbow, Excelsior, Deception and Sky Blue claims have been consolidated, and will be known as the Crossbow Mining Company. At the meeting recently held Dr. J. Koebig was elected president, A. Becker, vice-president, and W. E. Davis, W. R. Smedberg and H. D. Walker, directors.

SIERRA COUNTY.

BALD MOUNTAIN EXTENSION COMPANY.—The January clean-up from the gravel claim of this company was valued at \$8,453.12; 179 ounces of gold were produced in the first week of February.

COLORADO.

Mineral Surveys approved by the United States Surveyor-General of Colorado, during the two weeks ending February 27, 1892: Survey number, 7,298; land district, Montrose; name of claim, Boulevard Lode; 7,242, Leadville, Reliable Lode; 7,333, Del Norte, Amethyst Lode; 7,180, Leadville, Harry D., Jacob D., Wahl, Dearborn, Drusie Wilson, Eva Wilson, Pboe Grace, Emma, Simon D., Leo D., Elsie Frances, Pauline, Joseph S., Lillian Wilson and Augusta D. lodes; 7,270, Durango, Yellow Boy and Yellow Girl lodes; 7,236, Leadville, Jupiter Lode; 7,324, Pueblo, Buena Vista Lode; 7,300, Durango, Silver Cliff Lode; 7,310, Durango, Connecting Link Lode; 7,284, Montrose, Lincoln and Grant lodes and Lincoln Mill Site; 7,317, Central City, Evergreen Tunnel Lode No. 1 and the Giant Mill Site; 7,207, Leadville, Atlanta, Magnolia, Silver King, St. Louis, Silver Bell, Little Gertrude and Washington lodes. Amended surveys: Survey number 6,821; land district, Central City; name of claim, Post, W. P. R. and O'Connor lodes; 4,421 Gunnison, Little Minnie Lode.

LA PLATA MINES, LIMITED.—The receipts from the Leadville mines during January were \$2,230; from the smelter, \$500; profit, \$360. With the renewal of their leases at the beginning of the year the miners were engaged chiefly in preparatory work. Hence the smallness of the output for January. The manager reports that at the 275-ft. level of the White Cloud Mine (Red Mountain District) he has proved a mineralized ledge or reef 80 ft. wide, with well defined walls, and all the minerals and indications that obtain in the big mines of the district (New Guston, etc.) "The full importance of this can only be appreciated by those who are acquainted with the Red Mountain District. Our position is, briefly, that we have found the reef in position solid and compact; that the ore invariably makes in or on these reefs is an indisputable fact, and where such a mass of reef as that in the White Cloud is found, ore in paying quantities is invariably discovered in connection with it." The manager cabled under date February 15th: "There is great improvement in the White Cloud; copper pyrites in south drift; crosscut is getting into the mineral zone."

CLEAR CREEK COUNTY.

Says the *Idaho Spring News*: The placer miners for many miles down the creek are getting their machinery and appliances in shape for a big season's business. Placers as well as lodes will receive considerable attention during the coming summer.

CUSTER COUNTY.

BASSICK.—The sale of this property at Rosita to a syndicate of Omaha and Eastern capitalists is denied in Denver. It is said, however, that negotiations are under way for its purchase.

DOLORES COUNTY.

ENTERPRISE MINING COMPANY.—The mines of this company at Rico are reported to be looking better than ever. Production is maintained at the regular rate, though ore shipments have been delayed somewhat by snow. The shares of the company have been listed on the New York Stock Exchange.

EL PASO COUNTY.

It is said that Cripple Creek can ship 115 tons of ore per day by April. The Postal Telegraph Company has built a line to the camp, and it is hoped that the railway will soon follow. There are two banks there and several hotels, boarding-houses, dance halls, saloons and shops of various kinds. The town was incorporated on the 26th ult.

ANACONDA MINING COMPANY.—On the 26th ult. this company shipped 22 wagon loads of ore from its mine at Cripple Creek.

BUENA VISTA MINING COMPANY.—This company, of Cripple Creek, is shipping ore that returns \$143 per ton by the car load, the total value being in gold. The mine shows a vein 3 ft. wide. The shaft is now down 85 ft. The stock of the company is held chiefly in Colorado Springs by

Count de Pourtales and his associates. The value of the shares jumped from \$1.25 to \$7.10, when the result of the last shipment became known, so it is said.

GREAT VIEW.—This group of mines is reported to be showing the largest ore bodies of any mine at Cripple Creek.

LAKE COUNTY.

The Penrose shaft has reached a depth of nearly 600 ft., and until the 26th ult. a 1,000 gallon pump, which is in position at the bottom of the shaft, was found to be sufficient to keep the mine free from water. But a watercourse was struck, and on the 28th ult. there were 300 ft. of water in the shaft, but it is thought it will rise no higher. It will take 20 days of hard work to unwater it.

WOLCOTT MINING COMPANY.—According to the *Denver Republican*, articles of agreement were entered into on the 27th ult. between the Wolcott Mining Company, of Lake County, and Louis P. Wilkes, of Denver. By the terms of the agreement the Wolcott Mining Company will place in escrow, in the First National Bank of Denver, a lease and a warranty deed to the Lucy B. Hussey mine and a portion of the Star placer lode in Lake County. On Wilkes' depositing \$50,000 in the First National Bank, to be used in developing the property, he is to be given possession of the lease, which expires April 1st, 1897. If \$400,000 is deposited before April 1st, 1894, Wilkes is to obtain possession of the deed. If the deed is not taken before April, 1895, \$500,000 will be the price. The articles of agreement, unless these terms are complied with, expire April 1st, 1896.

(From our Special Correspondent.)

CASTLE VIEW MINING COMPANY.—The shaft of this company was to have been fitted with a cage and a much more powerful plant, but good lead carbonate was discovered in a drift run to connect the shaft with the workings of the Big Chief, so all attention has been paid to the mining and shipping of it. About 12 tons a day are shipped, with the chute widening out steadily.

DORIS.—This mine is opening out very nicely, and the ore found in a channel in the limestone is being upraised upon with a view of tracing it to the overlying porphyry, where it is now thought it will spread out in the contact plane.

GLASS-PENDERY.—This mine is being worked under lease after lying idle for many months, and the fortunate lessees are already shipping from the 160-ft. level some very fine ore. The shaft is to be sunk, however, to get to a lower bench of the Carbonate fault.

HOPE.—This mine on East Seventh street continues to open up the chute lately struck, and is stopping out everything above the 250-ft. level preparatory to sinking. The dip of the ore body to the east, together with the amount of water met with rendering this necessary.

LEO.—The pump at the 350 ft. station has been changed for a much larger one, and a station is being cut at 530-ft. level to hold a duplex Knowles of large capacity, and additional boiler power has been placed in steam room, and sinking will be resumed as soon as the lower pump is in position. It is believed that not more than 70 ft. of further sinking is necessary to put this shaft into the regular lime-porphry contact.

PAWNOLOS.—The shaft is to be sunk on this property, and to this end powerful hoisting and pumping plants are being placed over and on it, and a start will soon be made. This shaft is already down about 140 ft., and ought to catch the limestone within 200 ft. of the surface. It is on a direct line with a well known ore chute, and it is pretty generally thought that this group will prove a valuable one.

STAR OF HOPE MINING COMPANY.—The Bohn shaft is now being rapidly sunk, as the big station has been completed, pump placed in position, and but very little water is encountered. This shaft has a tendency to develop a great deal of good ground, particularly that to the southwest, that north and east of it having been proved to carry the ore chute continuously from the carbonate fault down.

OURAY COUNTY.

AMERICAN AND NETTIE MINING COMPANY.—The superintendent of the mine says in a recent letter to the directors that he is convinced that the main ore deposits are on a somewhat lower level and the drifts being run are to open this ground. One drift has found the dike, and ought, in a very few days, to find a large ore channel. This drift, from the bottom of winze 14, will be continued, to catch in turn each of the other channels which have already been discovered. The present output is coming from stopes J west, H 40½ and south 40, but work of breaking ore in drift 41 has commenced. Hopkins' shaft is being sunk as usual and the ground is getting a little more favorable.

PITKIN COUNTY.

MOLLIE GIBSON CONSOLIDATED MINING AND MILLING COMPANY.—Manager Palmer, of this company, has just issued a report of the company's operations from June 9th, 1890, to January 1st, 1892. The report shows the total tonnage of ore shipped to have been 4,545.23 net; ounces silver, 2,054,148.78; total gross value, \$1,893,549.99; net cash returns, \$1,791,463.62. The average price of silver per ounce was about 92; net returns per ounce, 87.3; average value per ton net, \$694.56.

SAGUACHE COUNTY.

The sale of the State's school lands at Creede was held on the 26th and 27th ult., as advertised. There was no trouble between the squatters and the speculators, as was anticipated, and everything passed off quietly. The bidding for the lots was lively. It is feared, however, that there may be some trouble when the purchasers attempt to take possession of their lots.

Judge Hallett, of the United States Circuit Court, at Denver, issued an order of injunction on the 2d inst., stopping the management of the Last Chance mine from extracting ore from territory in dispute between it and the New York claim at Creede Camp. Already \$250,000 worth of ore is reported to have been taken out of the disputed territory, and a big suit will result.

SAN MIGUEL COUNTY.

SHERIDAN & MENDOTA CONSOLIDATED MINING AND MILLING COMPANY.—An agreement has been made between the Smuggler-Union and Sheridan & Mendota Consolidated, by which the latter company agrees to transport through its tunnel and over its tramway all of the Smuggler ore. The underground workings of the two mines are now being connected and it is expected that the work will be completed about June 1st. As the ore is now all packed from the Smuggler-Union to the railroad it will be a great saving of expense. This will throw off nearly all of the burros on the Marshall Basin trail. There are now about 600 employed. A winze is being constructed from the fifth level in the Mendota to connect with the Sheridan shaft. When completed the Mendota ore, which is now being packed down, will be sent by way of the Sheridan inclines. There is a large amount of low-grade ore on the dump which can be worked to advantage by this saving of expense. The Sheridan-Mendota mill, which has been shut down for about 30 days on account of lack of ore, will start up again about April 1st. Ore is now accumulating at the mill at the rate of 25 tons per day.

IDAHO.

LEMHI COUNTY.

SOLOMON RIVER PLACER MINING COMPANY.—This company has filed articles of incorporation at Denver, Colo., with a capital of \$5,000,000. The directors for the first year are: J. B. Grant, C. H. Toll, A. A. Blow, Henry E. Wood, J. A. Graham, W. H. James, J. B. Henslee, J. B. Rickards and William G. Shedd. The company owns extensive placer claims in the Lemhi district. The titles cover three bodies of placer ground in Lemhi County, extending over several thousand acres, which have been carefully prospected. The claims were secured under the direction of W. G. Shedd.

OWYHEE COUNTY.

BLAINE.—The tunnel which was originally 4 x 6 ft. and about 600 ft. long, has been widened to 8½ x 8 ft. the full length, and is being driven ahead at the rate of 8 ft. per day. Double track has been laid the full distance.

CEUR D'ALENE SILVER LEAD MINING COMPANY.—Superintendent Clark gives the following particulars of the new find lately discovered in sinking the shaft below the 500 level: The new vein which was struck at 70 ft. below the 500-ft. level has been cut through and is found to contain 3 ft. of first-class ore. It only pitches 10 ft. in the 100 and runs parallel with the old vein, about 20 ft. north of it. The old vein was cut through at the 400 level, but no cross-cut was run north of it.

VENUS MINING COMPANY.—The crosscut tunnel is now in 75 ft. The tunnel is 7 x 7 ft., and timbered with sawed stulls and 2-in. plank. Some 500 ft. will have to be run yet to cut the big ledge decomposed, gold-bearing quartz.

KANSAS.

CHEROKEE COUNTY.

During the week ending February 27th the output of ore from the mining districts of Galena and Empire City was: "Rough ore, pounds milled, 2,624,660; rough ore, pounds sold, 1,106,350; zinc ore, pounds sold, 893,760; lead ore, pounds sold, 268,840. Sales aggregated a total value of \$15,453.

MASSACHUSETTS.

BRUNSWICK ANTIMONY COMPANY.—The works of this company at Medford were sold at auction on the 2d inst. The company was organized about twelve years ago and secured mines in New Brunswick, reducing the ore at Medford, but the scheme proved a failure.

MICHIGAN.

A despatch from Bessemer says that 800 timbermen from the Ashland, Aurora, Norris, East Norris and Pabst mines, at Ironwood, are on a strike. They demand an additional 25 cents per day. The companies will not yield.

COPPER.

CENTENNIAL MINING COMPANY.—There are no reports favorable to the opening of the mine at any time in the future, far or near. The mill is closed down in a manner to indicate that it will be idle for a long time. The officers of the mine have not yet been discharged, though there is little work to do. The employes have been paid up in full and many of them are moving away.

OSCEOLA CONSOLIDATED MINING COMPANY.—The report of this company for 1891 shows an increased

production of copper over any previous year, being 6,543,358 lbs., against 5,294,792 in 1890, 272,781 tons of rock were hoisted. The following is a summary of the results this year compared with the two previous years.

	1891.	1890.	1889.
Mineral product, lbs.....	7,590,903	6,169,686	5,262,997
Fine copper, lbs.....	6,543,358	5,294,792	4,531,127
Per cent. copper in mineral.....	86.2	85.82	86.15
Yield fine copper per ton, lbs.....	27.92	28.08	25.82
Mineral in stamp rock, per cent.....	1.62	1.63	1.50
Refined copper in stamp rock, per cent.....	1.40	1.44	1.29
Cost per ton, rock stamped.....	\$2.13	\$2.39	\$2.21
Total cost per lb, cents.....	10.11	11.24	10.05

During the year dividends aggregating \$150,000 were declared, leaving a surplus of \$7,886.46.

QUINCY MINING COMPANY.—The annual report of this company for 1891 shows that the product was 12,827,075 lbs. of mineral, yielding at 82.189% 10,543,519 lbs. of fine copper, for which was realized, at an average price of 12.841 cents per lb., the sum of \$1,353,827; from sales of silver, \$3,646; from interest, \$15,910, and from sales of village lots, \$5,850, making:

Total gross receipts.....	\$1,379,339
Running expenses at mine.....	\$594,859
Smelting, transportation and all other expenses.....	157,551
Building and construction.....	311,859
	965,269

Net income.....	\$414,970
Dividends, \$10 per share.....	450,000

Deficit.....	\$35,030
Balance assets, January 1st, 1891.....	742,045
Balance assets, January 1st, 1892.....	\$707,015

ASSETS.

Cash at New York office and copper.....	\$635,319
Cash on hand at mine.....	7,202
Accounts receivable.....	148,435
Supplies, etc., at mine.....	124,717
	\$915,673

LIABILITIES.

Drafts unpaid.....	\$501
Dividends unpaid.....	1,535
Accounts payable in New York.....	14,823
Accounts payable at mine.....	191,796
	208,659

Balance assets January 1st 1892.....	\$707,014
Less dividend, \$4 per share, paid February 23d, 1892.....	200,000
	\$507,014

The deficit of \$35,030 between the dividends paid and net earnings was due to the purchase of the Pewabic, as the extra shares issued to Messrs. Mason and Smith on account of the purchase drew the second dividend of \$5 per share, or \$50,000. These shares were also the cause of the reduction of the dividend paid on the 23d ult. to \$4 per share. The increase of production from 8,064,253 lbs. in 1890 to 10,543,519 lbs. in 1891 made the year a fairly successful one, although the cost of production was increased from 8.20c. per lb. to 9.14c., while the average price received was 2.50c. lower than in 1890, or 12.841c.; 652 men were employed by the company, of whom 182 were miners, earning \$53.40 a month on an average; 276,336 tons of rock were mined, of which 269,817 tons were hoisted and 263,678 were stamped. The report of S. B. Harris, agent at the mine, accompanies the financial statement. It seems that considerable development work has been done during the year, and the mine is in good condition.

TAMARACK MINING COMPANY.—The Osceola amygdaloid vein in this mine, between the 13th and 14th levels, is rich in copper and is said to look better than it does anywhere in the Osceola mine. The Osceola vein has been cut in six levels, five of which have been rich.

IRON.

Last week Capt. John Perkins and others began exploratory work on the S. W. ¼ of section 34, 40-30, a short distance west of Quinnesec. This work will consist in the reopening of some old explorations and their further development, and will be vigorously pushed.

CLEVELAND IRON MINING COMPANY.—On the 25th ult. this company abandoned the work of filling Lake Angeline near the Lake Shaft mine, for the present, at least, and the company's steam shovel, which was operated at the Lake Superior rock pile filling the cars, will be taken to the company's shops to undergo some needed repairs, preparatory to the big work that will be required of it next summer on the enormous stockpiles of the company. The work of filling the lake will probably be resumed the coming summer, to provide the company with ample room for its side tracks.

PABST IRON MINING COMPANY.—The widow of the fireman who was killed recently by the boiler explosion at this mine at Iron River has sued the company on the ground that the boiler was old and defective. The widow demands \$10,000 damages.

PEWABIC IRON MINING COMPANY.—At the Keel Ridge mine, says the *Norway Current*, a stockpile of a few hundred tons is beginning to attract at

tention. At the bottom level, at the end of a 200-ft. drift, west, a crosscut is being driven. A drift is also being driven at this level east of the shaft on the junction between the jasper and slates. At the second level, about 300 ft. east of the shaft, a crosscut is being driven to the north. The shaft is being sunk, and is now about 45 ft. below the third level. Some of the ore being hoisted comes from the opening work, and some of it from the different points where timbering and clearing up is being done, and there is, of course, much repairing to be done after the long term of years that this mine was full of water.

ROYAL MINING COMPANY.—A deposit of ore of fine quality has been struck on a property the company has under option on Section 12 at Ne-gaunee. The deposit is at the foot of the bluff in a swamp. A small pit was sunk there and a 2½-in. iron pipe was then driven to a depth of 15 ft. The pipe was then taken out and the lower portion of the core is pronounced to be soft hematite of good grade. The first work done at the Royal was sinking a test pit in the side of the hill. This was put down 25 ft. and gave good indications. The next move was to put down a pipe in this same line, but about 75 ft. farther down, with the result above stated. Pipe tests will be made in three or four different places.

WEST VULCAN.—The pumps have been carried down to the 12th level of the new shaft. The drift east from the north crosscut at the bottom of the shaft is in about 25 ft., and the ore shows a width of about 7 ft., of very good quality. A drift has been started to the west of the crosscut. Work will soon begin at the 11th level.

MINNESOTA.

CHARLESTON IRON COMPANY.—This company has filed articles of incorporation. The capital stock is \$2,000,000, and the incorporators are John McKinley, of Duluth; Frank Cox and A. E. Humphreys of Charleston, W. Va. The property controlled is lots 1 and 2, section 4, 58-18 and the east half of the southeast of section 33, 58-18, all of which adjoins the Mountain iron mine on the west and has heretofore been known as the Buckley claim. Of the company's capital stock, \$250,000 has been set aside as treasury stock for development purposes.

DETROIT IRON COMPANY.—This company has filed articles of incorporation, the corporators being James T. Hale, F. E. Kennedy and John M. Root. It is capitalized at \$3,500,000.

MINNEAPOLIS IRON COMPANY.—This company has been incorporated with a capital stock of \$3,000,000. The incorporators are as follows: George L. Becker, of St. Paul; A. R. McGill, Carmon N. Smith, E. M. Mabie and John J. Ankeny, all of Minneapolis; Walter S. Milner, of Excelsior; John McKinley, of Duluth, and A. E. Humphreys, of Charleston, W. Va.

CINCINNATI MINING COMPANY.—This company has leased 80 acres of ground from William Buckley, for 30 years. The terms of the lease were \$15,000 down, a guarantee of \$7,000 a year and a royalty of 30 cents a ton.

CHANDLER IRON MINING COMPANY.—A fire broke out February 21st at the No. 3 shaft of this mine, completely destroying the shaft house and extending to the timbering in the shaft. Monday night there was a cave which extinguished the fire. One man lost his life through suffocation. Owing to the stoppage of the pumps the mine filled with water up to the fifth level. The origin of the fire is unknown. The damage will amount to many thousands of dollars.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

Joplin, Feb. 29.
The lead and zinc mines of this district for the past two weeks have made an average output, notwithstanding the fact that the zinc ore market has been on the decline. The average price paid was \$21 per ton, choice lots selling at \$23. Lead ore has remained firm at \$23 per thousand.

Following are the sales of ore from the different camps for the past two weeks:

Joplin mines, 1,086,810 lbs. zinc ore and 274,080 lbs. lead; value, \$17,986.
Webb City mines, 527,270 lbs. zinc ore and 53,600 lbs. lead; value, \$6,900.05.
Cartersville mines, 2,189,820 lbs. zinc ore and 69,750 lbs. lead; value, \$25,144.85.
Zincite mines, 145,520 lbs. zinc ore and 1,660 lbs. lead; value, \$2,62.60.
Lehigh mines, 42,620 lbs. zinc ore; value, \$490.15.
Oronogo mines, 31,630 lbs. zinc ore and 4,100 lbs. lead; value, \$400.50.
Carthage mines, 42,000 lbs. zinc ore; value, \$472.50.
Galena (Kan.) mines, 636,500 lbs. zinc ore and 133,970 lbs. lead; value, \$9,779.
Districts, total value, \$63,794.65.

FEBRUARY 29.

Joplin mines, \$1,237,500 lbs. zinc ore and 301,520 lbs. lead; value, \$19,928.20.
Webb City mines, 668,060 lbs. zinc ore and 76,900 lbs. lead; value, \$8,746.40.
Cartersville, 1,765,700 lbs. zinc ore and 70,170 lbs. lead, value, \$20,118.25.
Zincite mines, 286,230 lbs. zinc ore and 3,510 lbs. lead; value, \$3,350.

Lehigh mines, 76,100 lbs. zinc ore; value, \$813.20. Oronogo mines, 5,470 lbs. zinc ore and 6,650 lbs. lead; value, \$204.30. Carthage mines, 524 lbs. zinc ore; value, \$6,037.50. Alpha mines, 80,000 lbs. zinc ore; value, \$840. Galena, Kan., 893,760 lbs. zinc ore and 260,840 lbs. lead; value, \$15,453.

Districts, total value, \$75,490.85. Messrs. Cooley, Holibaugh, Weston and Humes have just returned from a 10 days' trip of examination of the zinc fields of a portion of Marion County, Arkansas. During the trip the party made a thorough examination of the old Morning Star mine located on Rush Creek near Buffalo River. This property has been attracting considerable attention of late, owing to its fine yellow and white carbonate ore exposed at the different openings along the croppings on the side of the mountain.

Up to the present time but little development has been done, except by open cuts and strippings along the line of outcrop, but this has disclosed a vast deposit of zinc blende, and white and yellow carbonates. The ore is found intermingled with the gangue rock to that extent, however, that the mine cannot be operated without a large ore dressing plant. The Morning Star Company is now arranging for the erection of a complete plant, and has also closed a contract to ship their ore direct to Europe.

MONTANA.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—One of the stacks for carrying off the smoke from the roast heaps at Butte is now completed and another is under way. The one completed is 100 ft. in height. Forty kilns are also finished and 60 more are to be built.

The output of copper for the month of January was:

Period.	1891-92. Fine lbs.	1890-91. Fine lbs.
January.....	2,575,000	2,175,000
Since July 1st, 1891.....	16,330,000	15,915,453

BEAVERHEAD COUNTY.

JAY HAWK & LONE PINE CONSOLIDATED MINING COMPANY, LIMITED.—The additional five stamps to the 10 stamps of the Lone Pine mill commenced dropping on the 25th ult., which gives the company a milling capacity of 25 stamps, 20 stamps now being in operation. Upon development the quantity and value of the ore increases, stopping now being from a body of high grade ore 9 ft. in width. The incline from the vertical shaft has now reached a depth on the vein of over 900 ft. and is in a good body of ore, proving, it is thought, that the ore chutes increase in width as depth is gained. The mine has never shown so much ore as it does now, nor given such promise of permanency, says the Helena Journal.

DEER LODGE COUNTY.

BIMETALLIC MINING COMPANY.—This company has resumed operations after nearly a month's idleness, the new hoisting engine having been completed.

GRANITE MOUNTAIN MINING COMPANY.—Secretary Thos. O. Hyman has made the following report of the product of this company in 1891:

	Silver oz.	Gold oz.	Silver oz.	Gold oz.
January.....	261,206	510.34	August.....	236,665 314.14
February.....	228,347	454.14	September....	183,232 282.14
March.....	241,472	462.34	October.....	178,446 304.14
April.....	249,137	403.14	November....	256,498 440.14
May.....	273,138	389.14	December....	273,002 379.14
June.....	271,384	374.14		
July.....	249,532	345.14	Total.....	2,905,159 4,661.14

Since April, 1885, the company has paid monthly dividends aggregating \$11,800,000.

MEAGHER COUNTY.

CUMBERLAND MINING AND SMELTING COMPANY.—It is reported that the control of this company has been purchased by J. Kennedy Tod & Co., bankers, of New York, and financial agents of the Great Northern Railway, the deal having been effected through C. O. Parsons, of Great Falls, Mont. A railway, to be known as the Montana Midland, will, it is said, be built from the Neihart end of the Great Northern mountain belt branch to Castle, a distance of 45 miles. Work will be begun as soon as the weather permits, the surveys having already been made, and it is expected that the road will be ready for business by September, 1892.

The following will be the route of the road in accordance with the preliminary survey already made: Leaving Neihart it will follow the south fork of Belt Creek to the divide between Sheep Creek and the middle fork of Judith, thence along the creek, making a gradual descent to the north fork of the Musselshell and to the carbonate deposits of Smith River. From this point the line describes the letter S, the beginning of the letter beginning near the north fork of the Musselshell, and the latter part running through Robinson and Smith's Camp, finishing up at Castle. About the middle of the letter is situated the copper camp of Copperopolis.

The Cumberland mine has been doing excellently for some time past. On the 14th ult. the company paid \$75,000 on its indebtedness, and on the following day the sale of the property was consummated. J. Kennedy Tod & Co. when asked concerning this deal refused to say anything.

QUEEN OF THE HILLS MINING COMPANY.—Fifteen cars of ore have been shipped from this mine

to Omaha, and shipping from other Neihart and Barker mines, which was practically suspended when the Great Falls smelter shut down, is being resumed, owing to the \$12 rate made to Omaha.

MISSOULA COUNTY.

IRON MOUNTAIN MINING COMPANY.—The dividend of 3 cents per share paid by this company on the 25th ult. makes the total paid to date \$110,000 in cash, besides one in stock. The reports from the mine are now encouraging. The new concentrator is working well, while the mine never looked better, it is said. The winze being sunk from the tunnel has reached the depth of over 200 ft., a total depth of nearly 800 ft. from the surface. At the depth of 100 ft. in the winze a cross-cut has been run to the vein, in which a streak of high-grade ore, 28 in. in width, was encountered; a cross-cut will also be driven at the depth of 200 ft., and the sinking of the winze will be continued. It is estimated that there is now in sight sufficient ore to supply the mill for three years, besides a large amount of shipping ore.

SILVER BOW COUNTY.

All the smelters at Butte are running full blast, says the Miner, with no prospect of stopping.

ANDERSON.—It is reported that a large body of copper-silver ore has been encountered in the workings of this mine at Butte, near the Parrot addition. The shaft house was burned last week, but the loss was not large.

The Anderson shaft was begun on the 5th of October, last, and is now down 200 ft. Two veins are known to exist in the claim, and a crosscut is now being driven from the bottom of the shaft to cut the north vein, which it is thought will be reached in a few more days. There is considerable ore stored on the dump, no shipments having yet been made. The capacity of the hoisting plant will shortly be increased by the addition of a new and more powerful engine.

ALICE GOLD AND SILVER MINING COMPANY.—The 60-stamp mill of this company was closed down on the 21st ult., and 150 miners were laid off. The 20-stamp mill will be kept in operation. With regard to the situation Superintendent Hall said that during the last month the company had been operating at a loss, which it did not care to do any longer. He said that during the suspension some necessary repairs would be made to the machinery of the 60 stamp mill and everything else in and about the plant put in shape to resume at a moment's notice when the price of silver will warrant such resumption.

ANACONDA MINING COMPANY.—The mortgage of \$7,500,000 upon the property of this company, held by the Mercantile Trust Company, has been satisfied in full. J. B. Haggin has transferred all his personal property in Montana to the Anaconda Company.

BUTTE & BOSTON MINING COMPANY.—The output of this company for January was 1,960,000 lbs. of fine copper as against 710,000 lbs. the same period last year. The company is erecting an additional blast furnace of 100 tons capacity so as to insure its present output of about 2,000,000 lbs. of copper per month. The company has a force of nearly 400 men.

CZARINA.—A strike has been made in this property, owned by W. F. Farlin but leased by Col. J. O. Hudnutt, at the depth of 50 ft. The ore body, 2½ ft. to 4 ft. wide, was encountered 3 ft. from the shaft, and averaging, it is said, 150 oz. and 1½ gold to the ton. The mine is situated 500 ft. south of the Germania.

NEVADA.

ELKO COUNTY.

Following are the latest official letters from the Superintendent of Tuscarora mines:

DEL MONTE MINING COMPANY.—Line stopes produced nine tons first-class ore, assay value, \$26 per ton, and 24 cars second-class, \$38 per ton. Will commence hauling first-class ore to sampling works, 22d inst.

NAVAJO MINING COMPANY.—South intermediate drift below the 380 level has been extended six ft., showing some good ore in the face.

NEVADA QUEEN MINING COMPANY.—No. 2 raise from No. 1 south drift, second level, extended to hanging wall, passing through vein of low-grade ore. Vein 16 ft. wide at this point.

NORTH BELLE ISLE MINING COMPANY.—North intermediate above the 500 level extended, showing a good sized vein of first class ore.

NORTH COMMONWEALTH MINING COMPANY.—In the second level the west drift has been extended 12 ft. to Del Monte line, in vein matter. Stopes produced four tons first class, \$250 per ton, and 36 cars second class ore, \$35 per ton. A drift is being run from bottom of stopes to connect with 90-ft. drift, good ore in both drifts, about 30 ft. between the two.

HUMBOLDT COUNTY.

BOSTON ANTIMONY MINING COMPANY.—Burke Bros., builders and contractors, of Reno, have just completed a new furnace for this company, whose mines and works are located at Black Knob, east of Lovelock. The furnace is built in accordance with the designs of Dr. H. H. Hutchins, superintendent of the mines. It is expected to produce five tons per day of star antimony from the ores now being mined.

LANDER COUNTY.

BIG CREEK MINING COMPANY, LIMITED.—The Austin Advocate says the antimony mines are gradually increasing the force of miners, and will soon have recovered from the recent snowslides and have a full force of 25 men at work again.

LINCOLN COUNTY.

PIOCHE CONSOLIDATED MINING AND REDUCTION COMPANY.—Mr. A. H. Godbe reports, says the Salt Lake Tribune, that all the mines belonging to this company are looking splendidly. The strike made last month in its Day mine has proven a big bonanza, and it seems to grow bigger as it is developed. The company is running one furnace and reducing 40 tons of ore per day. This one furnace has turned out \$200,000 worth of hullion in the past four months. The company is preparing to put in a cupelling plant, and expects to have it running in a short time. There has been a shortage of lead, which has compelled the company to keep one furnace out of blast.

STOREY COUNTY—COMSTOCK LODGE.

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

BELCHER MINING COMPANY.—Have been extracting about 10 loads of fair grade ore from the stopes between the 200 and 300 levels. Are also extracting from 12 to 15 loads of ore from the 1,300 stopes. Shipped to the mill during the week for reduction 308 tons 1,610 lbs. of ore, the average battery assay of which was \$22.45.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—This company has made another hullion shipment, valued at \$13,819.40, to the Carson Mint, making total shipments on February account to date, \$38,993.14.

HALE & NORCROSS MINING COMPANY.—During the week we have hoisted 446 cars of ore from the 900, 1,100 and 1,450 levels; shipped to Nevada mill 420 tons, and milled 420 tons; average battery assay, \$22.24. Bullion yield for the week, \$6,535.

OVERMAN MINING COMPANY.—Extracted from 1,000 and 1,100 levels, 416 tons of ore. Car samples average \$49.61 per ton. Shipped to Brunswick mill, 436 tons of ore. On the 19th inst. shipped four bars of bullion valued at \$11,403.70.

SAVAGE MINING COMPANY.—During the week we have hoisted 818 cars of ore from the 750, 950, 1,100, 1,400 and 1,500 levels; shipped to the Nevada mill 682½ tons; milled, 683 tons; average battery assay, \$19.50. Bullion yield for the week, \$9,350.02.

YELLOW JACKET MINING COMPANY.—Shipping 50 tons of ore per day to the Brunswick mill

(From our Special Correspondent.) Feb. 25.

The following table shows the amounts of ore hoisted from Comstock mines, milled, and the average battery assays:

Mine.	Ore extracted. Tons.	Ore milled. Tons.	Assay Values. Feb. 20.	Feb. 13.
Belcher.....	308	308	\$22.45	.....
Con. Cal. & Va.....	991	980	21.66	\$23.50
Hale & Norcross.....	446	420	22.24	20.72
Overman.....	416	436	13.77	16.75
Savage.....	818	683	19.56	24.21
Yellow Jacket.....	266	.....	.....	.....

* Cars. † Car sample assay, \$19.61.

Through a delay in the mails the following letter arrived too late for our last issue:

SAN FRANCISCO, Feb. 19.

HALE & NORCROSS MINING COMPANY.—The current week has been consumed by defendant's counsel in the now celebrated suit of M. W. Fox against the infamous directors of this company and their co-conspirators in putting witnesses on the stand for the purpose of protecting the slime ponds, the contents of which last week were asserted by several witnesses for the defense to be almost, if not actually, valueless.

J. B. Woodbury, superintendent of the Eureka and Morgan mills, testified that he received his orders from Mr. Mackay. He made a bid of \$10,000 for what he estimated as about 10,000 tons of the Norcross slimes. Finding the transaction too heavy for himself he negotiated on the same basis on behalf of the milling company. He estimated they could have cleared \$15,000 on the deal; he had reported the particulars of the purchase to Mr. Joes, Mr. Mackay and Mr. Flood. Q. "Then tell me how could Senator Jones, of the Nevada Mill Company, sell to Senator Jones, of the Comstock Mill Company?" A. "As Senator Jones is interested in both companies, I didn't think he would have anything to do with it."

The witness testified that for some years he was in the Omega mill devoted solely to tailings. (It was at this mill the Bonanza firm made the enormous profits in early days.) He failed to remember how high the tailing assays went, but acknowledged that the profits were very large on \$12 and \$15 slimes. Q. "Then you acknowledge that profits were then made on \$12 slimes?" A. "I don't think so?" Q. "Then how did you propose making \$15,000 on 10,000 tons of slime which assayed \$15 from the Norcross?" A. "Because I could have worked them at the Morgan mill up to 78% or 80%."

The witness concluded by testifying that there is an annex (little joker) to the Eureka and Morgan Mills, the product of which goes to the mill company.

John Barclay, foreman of the Nevada Mill, gave a description of the working of ores in that mill. The substance of the direct examination was to

show that the sluices were of little value, and that the ore had been properly worked in every way; but on cross-examination he said: "The Hale & Norcross ore was shipped in railroad cars estimated to contain 7½ tons of ore each, and at this estimated rate I accounted to the mine."

Q. "Then if the car contained, as a matter of fact, 9 tons, you only accounted for 7½ tons?" A. "Yes, but I turned over all the bullion that belonged to them."

Attorney Baggett, being interrupted by the defense, stated that it was in testimony that over 5,000 tons of Hale & Norcross ore had been shipped to the mill by these cars and had never been accounted for.

Q. "Mr. Barclay, how did you know that Hale & Norcross were being properly worked?" A. "We take a pulp assay which shows the value of the ore, and also a settler sample which shows the amount run off. By comparison I could tell how close the ore was being worked."

Attorney Baggett then proceeded as follows: "Suppose your battery assays for April, 1889, averaged \$29.55, and your settler averaged \$2.74; and suppose you run 4,579 tons of ore, what would be the result?" The result, as worked out on the blackboard, showed \$122,762.99 to be accounted for in bullion.

"No allowance has been made for the slimes," interrupted the witness. Calculating the slimes at \$16 per ton, or 10 tons of ore as one of slimes—making this allowance of \$7,328.40 for slimes, the amount remaining to be accounted for was \$115,434.59.

Q. "Is this the amount that should have been returned to the mining company?" A. "Yes." Q. "As you only returned \$90,555.12 that month, leaving a balance of \$24,879.47, what became of that amount?" A. "So far as I know everything was worked fair, and I cannot account for the shortage."

"Then let me try again," said counsel. "Take the month of November, 1889, your battery assay showed average \$30.10 and your settler \$2.48 with 3,900 tons worked. The total amount less the settler was \$107,818, with \$6,240 allowed for slimes, leaving a balance of \$101,578 representing bullion due the mine. As you only returned that month \$85,292, \$16,286 is left unaccounted for, can you tell what become of this amount?" A. "I cannot account for the discrepancy at all." "Then" stated Attorney Baggett "this is all I will ask the witness."

C. B. Benham, assistant foreman of the Nevada mill, failed to explain the shortage in bullion returns, but stated that Evan Williams instructed him to make a series of experiments recently on the value of the tailings, the slime ponds and the concentrates worked in the "Little Joker." His figures went to show that they were of little or no value.

Gottlieb Haist, surveyor at Virginia City, gave the following cubic contents of the several slime ponds: Reservoir A, 13,744 cu. ft., containing 490½ tons; reservoir B, 11,700 cu. ft., containing 417½ tons; reservoir C, 45,440 cu. ft., containing 1,622½ tons; reservoir D, 30,920 cu. ft., 2,452½ tons; reservoir E, 54,523 cu. ft., containing 1,652½ tons; total, 206,327 cu. ft. He used 28 cu. ft. dry and 33 ft. wet to the ton. The cubic feet to the ton were estimated by Mr. Benham.

William Pearce, foreman of the Norcross mine, described the ore body in the mine discovered by him in the fall of 1887. He was instructed to send no ore to the mill that did not go \$12 to \$14 per ton, but admitted that some cheaper rock was shipped; he didn't know how much.

C. W. Meyers, assayer, of Virginia City, said that he was sent to the Chollar assay office from San Francisco, by R. Hayward and is paid \$150 per month. He testified that he was accustomed to making exaggerated assays of ore coming from the Hale & Norcross, but could not say why he did so. At a later date when recalled to the stand the witness qualified this remark by saying that the result of his assays were false as to showing the true value of the rock. Explaining his method, he said: "I took a pound of rock from the sample sent me; crushed about half a pound, then put it through the sieve. Fifty per cent. would not go through the sieve and I threw it away. This I regarded as the poorest part of the rock."

"Why did you consider the portion discarded the poorest?" witness was asked. A. "Because the finest part is always the richest." Q. "Would not the clay, which is not the richest, etc., go through first?" A. "Yes, the clay is the poorest; but, correcting himself "I will not allow that it is higher or lower in value than that I threw away. I have never made a test." Q. "If you had happened to throw away sulphurets would you not have considered them more valuable than the clay?" A. "Yes, but if I threw away sulphurets it was exceptional." Q. "How could you tell what you were throwing away as you say you made no test, but discarded what would not crush easily?" A. "Well, I did the best I could. I had 100 to 150 assays to make per day from 7 A. M. to 1 P. M., and we assayed the best we could." Q. "Do you crush the rock in the mortar yourself?" A. "No, I have three assistants. My part is weighing and figuring. Two men do the crushing, throwing away, and the sieving." Q. "How can you tell then what was thrown away?" Witness admitted that at all times he

did not know, but assumed that only the quartz was discarded.

Feb. 26.

The hearing in the suit against this company was resumed before Judge Hebbard on Tuesday. W. Hardy was the first witness summoned for the defense. He stated that he had been a millman on the Comstock from 1863 to 1887. Testimony related mainly to the working of the slimes. While under cross examination he admitted having been a director of the Kentuck Mining Company, and while holding office a contract was made by which the contractor was obliged to return to the company 65% of the assay value of the ores at the mine. This admission was a direct contradiction to his direct testimony wherein he said that the 65% was of the battery assay. Mr. Hardy also stated that he milled ores for the Crown Point and Belcher companies in their palmy days and that the mills always retained the slimes and tailings. He confessed that the mines were controlled by Senator J. P. Jones, A. Hayward and Senator Sharon. The mills, too, were then owned by the same trio. He gave it as his opinion that \$7 per ton was not too high for milling, for the mill company ought to make \$2@3 per ton profit. If in working 4,500 tons of ore there was a deficit of \$32,000 in the bullion return, as shown by the battery and settler samples, witness allowed that it would require investigation.

Governor Stevenson, during the celebrated Kentuck suit, testified that the battery samples were always higher than the car samples, but the witness failed to remember such testimony, although he was a director in the Kentuck Mining Company at the time. Mr. Hardy's assertion, while on direct examination, that the car sample assays ran about \$10 per ton higher than the battery assays was further discounted, and then he conceded that in some mines the car samples would range higher and others lower than the battery assays. He, in common with previous witnesses, testified that slimes could not be worked at a profit while green.

Q. "Do you not work a certain percentage of slimes in with the sand in the mill?" A. "Yes; what slime can be retained in the mill can be worked profitably." Q. "Well, what is the difference between the slime inside and those outside of the mill?" A. "My experience shows no difference between the two."

C. W. Meyers, the Virginia City assayer, recalled for re-examination, was asked to examine a sample of ore marked G No. 1. He testified that if he assayed it all the hard rock would be left in the screen and the metal would go through the sieve (40 mesh) and would assay much higher than the former. He identified the sample submitted as resembling Hale & Norcross ore. Q. "Assuming it to be Hale & Norcross, and that it would assay \$150 per ton, what ought the matter remaining in the sieve to assay?" A. Oh, about \$20 per ton."

To rebut this testimony Assayer Syvers, of San Francisco, on behalf of the plaintiff, produced certificates of assays of the Hale & Norcross ore. The finer portion of the ore which went through the sieve (40 mesh) in the manner described by Meyers assayed \$157.77. The portion usually discarded and described by Meyers as hard rock assayed \$169.52."

W. K. Aldersly, a Cornish mining expert residing at Napa, testified for the defense, which tried to prove by him that it would be a hazardous experiment to erect a milling property on the Comstock at an expense of \$300,000, but counsel for the plaintiff objected to the question, and addressing the court said: "The proof is in evidence that the Nevada mill, having cost about \$300,000, worked 150,000 tons of ore during the past three years at a profit of half a million dollars; calculating it on the basis of Mr. Levy having received \$30,000 for one-eighth profit of working 79,000 tons of Hale & Norcross ore."

Daniel Grant, foreman of the Savage mine, was called to prove the unreliability of car sample and mine assays. He cited a case where he had made computations between car samples and battery assays of Savage ore, and the former were in all cases the higher. On cross-examination he was asked: "If the car samples are higher than the value of the ore, tell the court how you know the ore you have on the floor of the stope is of sufficiently high grade to pay?"

A. "We always take samples and have them assayed, and our instructions are to send no ore up that won't run \$12@14 to the ton." Q. "How is it then that the Norcross Company sent 25 cars from one level, in one day, that assayed only \$8 per ton?" A. "If we have any doubtful ore we sample it. The sample may show a value of \$20 per ton, but when hoisted to the surface the carman who samples it might select a piece of rock that would only go \$8 per ton." Q. "Then the car samples do not always show an assay higher than the value of the ore?" Witness appeared confused, but failed to explain the contradiction in his testimony.

Charles E. Elliott, secretary of Chollar, Potosi and other mining companies controlled by Messrs. Hayward & Hobart, stated on cross-examination that his salary aggregated \$1,000 per month. He was cognizant of the fact that Hayward & Hobart controlled the mills where the ores from the mines owned by the companies of which he is an official was and is being worked at a charge of \$7

per ton. He confessed that he had taken orders regarding the mine from Hayward, but would not do so from others of the stockholders. He was aware that neither Hayward nor Hobart were directors of any of the companies, but he had a general knowledge that they controlled things. He believed that there were letters on file in his office which showed that bullion belonging to the Chollar Company had been turned over to the Potosi Company at a time when the Potosi was not producing bullion. Such transfers were made by direction of A. C. Hamilton, superintendent of both mines (this gentleman is also part owner of the Nevada M. & M. Company and brother-in-law of Senator J. P. Jones). At this point Attorney Baggett, addressing the Court, said that the witness having had the hardihood to confess to being the pliable tool of the ring that controlled both mills and mines, for which he was paid at the rate of \$1,000 per month, he had nothing further to say or any other questions to ask.

A. K. Durhrow, Secretary of the Gould & Curry Mining Company, testified to the fact that it cost from \$4¼@5½ per ton to work the refractory ores of the Occidental mine, and that his company paid \$7 per ton for milling.

Charles H. Fish, president of the Consolidated California & Virginia and Ophir Mining companies, while under cross-examination, testified that his companies paid from \$6@7 per ton for milling, the latter sum most of the time. The Consolidated California & Virginia was milling under a contract, originally let to Senator J. P. Jones, but transferred by him to the Comstock Mill and Mining Company. Q. "Who compose the Comstock Mill and Mining Company?" A. "J. P. Jones, John W. Mackay, and J. L. Flood." Q. "Who signed the contract for the mill company?" A. "Senator J. P. Jones." Q. "And who signed for the mining company?" A. "I did." Q. "By whose orders?" A. "Mr. Mackay's."

Witness admitted that Mackay controlled both mines and mills; that no man was kept at the mill to represent the interests of the mine, and that all bullion returns to the Con., Cal. & Virginia office were based on the battery assays made at the mill.

James Woodhury was recalled by the defense to prove the cost of milling ores at the Eureka and Morgan mills. A statement prepared by him for the Morgan mill was as follows: Freight per ton, from mine to mill, \$1.25; labor per ton, 90c.; wood per ton, 75c.; quicksilver per ton (allowing 2¼ lbs. loss), \$1.20; castings per ton, 30c.; miscellaneous per ton, 25c.; bluestone and salt, 18c. Total, \$4.83. At the Eureka, a water mill, the expense was much the same.

Upon being cross-examined he stated he based his opinion that \$7 per ton was not too heavy a charge, because at the Eureka mill it cost \$4.91 to mill a ton of ore, an extra charge of 8 cents per ton in excess of the Morgan mill charges being necessary for transportation. Witness being asked how he arrived at the expenses itemized above failed in several instances to substantiate his figures. For labor, instead of 90 cents, he could only make out 45 cents, and upon being questioned by the Court ran it up to 54 cents, but said several men that he could not remember were working around.

John Barclay, foreman of the Nevada mill, testified that the mill paid 75 cents per ton for water power. In cross-examination he testified that Messrs. Hayward & Hobart owned the Virginia & Gold Hill Water Company from which water was obtained (J. B. Overton, superintendent of the Water Company and president of the Nevada Mill Company). With this witness the defense announced their case as closed.

For plaintiff the last named witness was called in rebuttal. Being asked the cost of working of ore at the Nevada mill, he gave the following: Working 240 tons (the mill's capacity for one day), \$848, or an average of \$3.55 per ton. Under cross-examination witness allowed that perhaps there were items he had not included. This witness concluded this week's hearing, an adjournment being taken until Monday next, when plaintiff will call several witnesses in rebuttal.

NEW MEXICO.

GRANT COUNTY.

According to the Silver City *Southwest Sentinel*, the gold strike at Central, which caused considerable excitement there last week, is not so extensive as was at first reported. There was a small amount of rich ore discovered.

TEEL & POE MINING COMPANY.—It is reported that high grade ore has been struck at this mine at Cook's Peak.

MINERAL POINT ZINC COMPANY.—This company, says the Silver City *Sentinel*, will soon commence the shipment of zinc ore from its mines in the Hanover district. No ore has been shipped from these mines for nearly a year on account of the low price of spelter, and a good many hundred tons of ore are now piled up at the mines awaiting shipment. Since the last shipments were made from these mines the Silver City & Northern railroad has been completed, and the cost of shipping ore from Hanover is lower than ever before.

OHIO.

TUSCOLA COUNTY.

It is reported that soft coal has been discovered in Fairgrove township, in this county.

PENNSYLVANIA.

COAL.

The Schuylkill Coal Exchange has issued a report dated Pottsville, February 29, which shows that the following collieries drawn to return prices of coal sold in the month of February, 1892, to determine the rate of wages to be paid, make returns as follows: P. & R. C. & I. Co., Tunnel Ridge Colliery, \$2.20; Locust Spring Colliery, \$2.24; Glendower Colliery, \$2.28; Potts Colliery, \$2.22; H. L. Williams, Draper Colliery, \$2.19; total, \$11.14. The average of these rates is \$2.22. The rate of wages to be paid for work for last two weeks of February, 1892, and first two weeks of March, 1892, is nine (9) per cent. below the \$2.50 basis.

COXE BROS. & CO.—A dispatch from Hazleton says that Coxe Bros. & Co., of Drifton, have secured the entire output of the combined Pardee interests, amounting to 100,000 tons annually. They purchase the coal at the breaker and ship it as they please. This increases the Coxe output to 2,500,000 tons and leaves the Coxes masters of the operating fields in that region.

DAVIDSON COKE WORKS.—The large frame stable at these works was burned on the 19th ult., and 20 head of horses and five mules were lost. It is not known how the fire originated. The property destroyed is estimated at \$6,000, on which there is \$3,500 insurance. The works were forced to shut down and were idle until the 1st inst.

DUNBAR FURNACE COMPANY.—This company will erect a boiler house and two dwelling houses at the borehole, near Isaac Smith's, at Dunbar, and supply steam for its mine from that place. The company is also sinking a shaft on the Riner place, near by, for the purpose of opening the 4 ft. vein of coal with which to supply fuel for the boilers. The company will lay a pipe line from the furnace to supply the boilers with water.

GLENDON.—This colliery at Mahanoy City, operated by J. C. Haydon & Co., which has been idle for several weeks, has resumed operations, and will employ 400 miners.

H. C. FRICK COKE COMPANY.—At the Adelaide plant of this company, says the *Connellsville Courier*, several extensive improvements have recently been completed. An electric plant has been installed to light the mine. Lights are also placed on the tipples, in the shops, engine-room, lamp-house, boiler-room and in the company stables. A new air shaft has been sunk for the purpose of better ventilation. It is 9 ft. x 13 ft. and 40 ft. deep. Over the shaft a 20-ft. fan is erected. The fan engine is 16 in. cylinder and 32 in. stroke, and is set on a stone foundation 10 ft. high. The fan is run at an average speed of 48 revolutions per minute, forcing from 8,000 to 10,000 cu. ft. of air into the mine. The return current finds its way out the manway and hoisting shaft.

To keep the run of the men in the mine the check system has been adopted. Each employe in the mine is given a brass check with his number on it. In the morning his check is given to the fire boss when the miner receives his lamp. The checks are then hung on a board in the manway and returned to the men at the end of the run.

NEW YORK AND MIDDLE COAL FIELD RAILROAD AND COAL COMPANY.—This company has been incorporated with a capital of \$1,150,000. The incorporators are Israel W. Morris, Philadelphia; Charles Hartshorne, Merion; James I. Blakslee, Mauch Chunk; Elisha P. Wilbur, South Bethlehem, and Effingham B. Morris, Philadelphia.

READING COAL & IRON COMPANY.—The Keystone, one of this company's oldest collieries, shut down on the 2d inst., having been worked out. The machinery will be moved from the plant and the mines will be allowed to fill with water. It has not been worked for some time past, owing to a shortage of coal, and the force of employes has been reduced almost monthly until there were but 150 men and boys at work. Many of these will be given employment at the Potts colliery.

SPRINGDALE.—The miners employed at the Springdale, or Park No. 1, Colliery, at Mahanoy City, operated by Leutz, Lilly & Co., struck on the 29th ult. against the monthly pay system, which, they were notified, would go into effect at once. On the 2d inst. the owners announced that semi-monthly payments would be continued. Work was resumed on the 3d inst.

SUSQUEHANNA COAL COMPANY.—An explosion of gas occurred February 29th, at No. 1 shaft of this company at Nanticoke, by which two brattice men, James Martin, Jr., and George Gibbs, were burned. Gibbs' injuries are severe and may die. Martin will recover.

YOUGHIOGHENY RIVER COAL COMPANY.—This company's store at Scott Haven was destroyed by fire on the 20th ult. The loss is from \$8,000 to \$10,000. The origin of the fire is unknown.

UTAH.

CACHE COUNTY.

RED JACKET MINING COMPANY.—An important strike is reported in the Red Jacket mine at La Plata.

JUAB COUNTY.

At Tintic the Mammoth has 175 men employed. The Bullion-Beck & Champion is shipping the usual amount. There is a rumor of a draught at this mine which probably means a reduction in

shipments. The Eurka Hill is now beginning to ship over the new railroad the vast amount of ore which has been stowed away in its ore bins for several months past. The difficulty experienced by the Denver & Rio Grande road through the action of the Union Pacific, in jumping on all available rights of way to Beck and Keystone mines, will be overcome by the new road building a huge trestle work over the county road at the west end of Main street, Eureka, by which the road will easily reach the Keystone ore-house and can readily extend its switches, as occasion may require, to the north or northeast of the town as the production of the mines shall justify such extension.

BROOKLYN MINING COMPANY.—At a depth of 140 ft. the shaft is in ore, the vein being 6 ft. wide, carrying a fine quality of carbonate ore.

MILLARD COUNTY.

Councilor Melville, of the legislature, in company with others, owns a mountain of lithographic stone located about 23 miles from Deseret, on the line of the Union Pacific Railway, says the *Salt Lake Herald*. Samples of the stone were recently sent to one of the largest lithographing firms in the East and thoroughly tested. The reply came back that the stone was undoubtedly the best that had ever yet been discovered in America, but through being taken from too near the surface, it was a trifle softer than that usually employed for lithographic purposes. There was no doubt, however, in the mind of the lithographers but that the stone would harden as depth was attained, and it would then be perfect. It polishes easily and smoothly, and Mr. Melville says the supply is immense.

MERCUR MINING AND MILLING COMPANY.—An important discovery is reported in this mine in the Floyd district. The vein is a flat one, and is being operated by drifts and crosscuts, leaving pillars for supporting the roof. They have been taking out about 8 ft. in depth of ore, leaving a roof of what looked like porphyry, and which they had never broken into. Recently a portion of this roof fell in one of the drifts, and the foreman, in examining it, found that it was ore of equal value to the ore which they had been taking out. A raise was made to a solid roofing, and now they have 14 ft. of ore instead of 8 ft.

SAN PETE COUNTY.

Excellent coking coal has been discovered within 3 miles of Gunnison, and about 1½ miles from the Sevier branch of the Rio Grande Western, says the *Salt Lake Herald*. The discovery was made at a depth of 40 ft.

SALT LAKE COUNTY.

A strike of ore has been made in the Reed & Goodspeed tunnel in Little Cottonwood Cañon. The tunnel has been driven 3,000 ft. and struck the vein 1,250 ft. from surface.

HIGHLAND.—A vein of high grade ore has been opened in the lowest workings of this mine. This ore is a new body, and is said to be the best ever struck in the mine. Henry Denhalter, one of the owners, says that the ore assays 75 ozs. silver and \$10 gold per ton, and 30% lead.

LEONARD.—The Leonard mine, one of the York Hill properties, is reported to be looking exceedingly well at the present time, says the *Bulletin*; a strike comprising a 20-in. vein of galena, assaying 60% lead and 11 ozs. silver, was made in the face of a 200-ft. tunnel, holding out well both in quantity and quality. Ore is being taken out daily, and regular shipments will be made in the future.

MINNIE.—The lower tunnel is now in nearly 75 ft., and ore has been encountered going as high as \$150 to the ton, mostly gold. The mine is situated at Carr Fork, Bingham.

SUMMIT COUNTY.

DALY MINING COMPANY.—The Marsac Mill refinery has at last produced bullion from the refining of lixiviation sulphides by the Stetefeldt process. The first lot averaged 942 fine, and the second 980 fine.

MEARS GOLD AND SILVER MINING COMPANY.—The report that this company had cut the Daly vein at 500 ft. is denied. It is rumored that a combination to be known as the Hearst Mining Company will be formed to work this mine as well as the Daly West.

WISCONSIN.

ODANAH MINING COMPANY.—This company has bought the lease of the Kakagon mine from Frederick Rhinelandt for the sum of \$52,306.86. The owner of the land is the Northern Chief Iron Company, and this company issued a lease for 20 years from 1889. The mine was formerly known as the Kakagon, but is now known as the Carey and West Carey. The consideration, \$52,306.86, is considered cheap, owing to the ore indications.

BAYFIELD COUNTY.

Copper has lately been discovered in the Montrose property about one and one-half miles from Wasburn. Explorations are to be made. The property is owned by H. D. Weed, C. I. C. H. Graham and Dr. C. W. Pease. The strike was made in a shaft 80 ft. deep.

WYOMING.

NATRONA COUNTY.

PENNSYLVANIA OIL COMPANY.—This company is now drilling on the third well, located 42 mile

north of Casper on Salt Creek, and expects to reach the oil sand very soon. The well is only 700 ft. from the company's famous gusher, which was struck a year ago and was plugged after the oil had flowed down the creek several miles. The company is composed of seven very heavy oil producers of Pennsylvania, with large capital and all practical oil men.

FOREIGN MINING NEWS.

SOUTH AFRICA.

It is stated that a scheme for the employment of convict labor in the gold mines of the Transvaal has been discussed with the leading mining representatives by Mr. Munnick on behalf of the government. The employment of white convicts has been deemed impracticable for many reasons, and this portion of the scheme has been abandoned, after evoking hostile demonstrations from free mining labor, and leading to the formation of a labor union. The utilization of Kaffir convict labor stands, however, on a different footing, and the mines are ready to take more than the authorities have at disposal. The regulations for this new departure are being drafted.

UNITED KINGDOM.

ENGLAND.

Harold Frederic wrote as follows to the *New York Times* of the 28th ult: A fortnight hence, unless the unexpected happens, England will enter upon a remarkable kind of experience, an issue which may be of much importance to the world at large. The Colliery Proprietors' Association, representing every mine in the North of England, and the Miners' Federation, embracing 280,000 miners, are agreed that coal is too cheap for profit, and wages too low for comfort. Accordingly they propose to combine and stop work for an undefined period, with the view of creating a coal famine. A general closure has been ordered for March 12th. The expectation is that the shortage will swiftly affect the factories, gas works and household needs, and compel a speedy concession of higher prices in order to prevent competition from Belgian and German fields. The Miners' Federation is working to secure the co-operation of the sailors' and longshoremen's trade leagues to boycott the transmission and handling of foreign coals. How much trouble this bold scheme will cause remains to be seen.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 4.

Heavy Chemicals.—The close of the week under review sees the heavy chemical market somewhat unsettled by the alarming reports of an impending general strike of the English coal miners. If, as threatened, the strike commences on the 12th inst., it will bring about a deplorable state of affairs, for it will affect seriously all branches of British industry. Already chemical makers on the other side have cabled to their agents or representatives here warning them against making sales for forward shipment, and, consequently, holders in this city now maintain a firmer position, with some indications of a rise in values. A fair amount of business has been done during the week at prices a shade higher than those which prevailed at the time of our last report.

Caustic Soda.—This chemical is firm though somewhat excited, due to the causes mentioned in the preceding paragraph. Quotations for caustic soda on the spot are as follows: 60%, 3-12½@3-25c.; 70%, 2-95@3-10c.; 74%, 2-97½@3-12½c.; 77%, 3@3-12½c.

Carbonated soda ash is steady at 1-65@1-75c. for the 48% variety and 1-50@1-62½c. for 58%.

Alkali.—The usual business was done in this chemical. The 58% was sold at 1-47½@1-60c. No 48% was sold. Nominal quotations for this are 1-57½@1-65c.

Salt Soda.—This article continues depressed and low. We quote the English 1-05@1-12½c. and domestic at 95@1-05c.

Bleaching Powder.—Bleach continues quiet with quotations at 2-15 @2-20c.

Acids.—Manufacturers report a very fair business for the current week, and speak encouragingly of the excellent prospects for a good trade during the year. The market is devoid of features of interest. We quote this week for 100 lbs. of acid in New York, in lots of 50 carboys or more: Acetic, \$1.60 @ \$2, according to quality; alum, lump or ground, \$1.55@1.80; muriatic, 18°, \$1; 20°, \$1.12½@1.25; 22°, \$1.25; nitric, 40°, \$4; 42°, \$4.50@4.75; sulphuric, 90c.@1.10; oxalic, \$7.25@8.75. Blue vitriol is quoted all the way from \$3.25@3.50.

Brimstone.—Under advices from the other side the price of Sicilian brimstone continues to decline, and in view of the fact that the demand is not expected to increase in the near future it would appear that bottom prices have not been reached yet. The market during the week has been quiet. We quote: Best unmixed seconds, on the spot, \$24.50; thirds, \$23.50. For shipment, best unmixed seconds, \$27; thirds, \$1 less.

Fertilizing Chemicals.—Stocks are abundant, but the demand has not been very good. Some sales of no special significance are reported. Quotations show but little change. Sulphate of

ammonia, 2.95@3c. for spot. Dried blood, \$1.95 per unit for high grade and \$1.85 for low grade. Acidulated fish scrap, \$13.50 f. o. b. factory. Dried scrap, \$23.50@24. Azotine, \$1.95. Tankage, \$19 @ \$21. Bone meal, \$22@23.

Double Manure Salts.—Quotations are about as follows for winter shipments, ex-vessel New York, in lots of 10 to 50 tons: 48%, 53%, 1.18 1/2 @ 1.28 1/2 c.; 90-95%, 2.18 @ 2.23 1/2 c.; 96-99%, 2.21 @ 2.23 1/2 c.

Kaunit.—There is no business doing in this article. Quotations remain \$8.75@9.50, according to quantity, time of delivery, etc.

Muriate of Potash.—Only a small jobbing demand is reported. Prices remain as fixed by the syndicate.

Phosphates.—Nothing of interest can be reported so far as the local market is concerned. Prices continue at \$6 for dried and \$5 for undried, with freights at \$1.75@2.

Nitrate of Soda.—The nitrate market is somewhat firmer than when last reported. Quotations are: \$1.80 ex-store or to arrive, near by and shipments \$1.72 1/2 @ \$1.75. Messrs. Mortimer & Wisner the well known brokers of this city, send us the following interesting statistics of nitrate, dated March 1st:

	1892.	1891.	1890.	1889.
	Bags.	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A. from Jan. 1, 1892, to date.....	66,404	93,130	155,122	74,440
Imported into Atlantic ports from Europe.....	66,404	93,130	155,122	74,440
Stock in store and afloat Mar. 1, 1892, in New York.....	40,963	47,554	72,644	58,298
in Boston.....	500			
in Philadelphia.....		3,000	1,500	5,000
in Baltimore.....				
To arrive, actually sailed.....	270,000	182,000		
Visible supply to July, 1892.....	311,468	232,554		
Additional charters.....	169,000	237,000	506,200	244,700
Total supply when shipped.....	480,468	469,554	580,344	307,998
Stock on hand, Jan. 1, 1892.....	53,585	36,454	22,009	87,043
Deliveries past month.....	22,654	66,828	52,844	22,984
Deliveries since Jan. 1 to date.....	78,521	79,030	103,302	98,185
Total yearly deliveries.....		634,207	673,679	546,589
Prices current Mar. 1, 1892.....	1.82 1/2 c.	2.10c.	1.72 1/2 @ 1.75	2 1/4 @ 2.30

Included in the deliveries of 1889 are 23,678 bags shipped to European ports.

NOTES OF THE WEEK.

The United Alkali Company, Limited, has appointed Messrs. James Lee & Co., and Edward Hill's Sons & Co., the sole agents in the United States for the sale of foreign caustic soda.

Liverpool. Feb. 21.

Special Correspondence of Joseph P. Brunner & Co.) With the exception of chloride of potash, there is no activity in our market for chemicals. Chlorate, however, has had another smart advance, and second-hand parcels have been eagerly picked up, as high as 6 1/2 d. per lb. having been paid, while at the close this price is refused, and there are no sellers at under 6 1/2 d. per lb. The "Union" is off the market altogether at present, having nothing to sell before April and declining to quote at present for any position. It looks as if the price had not touched top yet, and we will probably see 7d. per lb. reached before long.

Soda ash keeps very steady, but not a great deal doing. We quote the commoner qualities as follows:

Caustic ash, 48%, £5 6s. 3d. per ton; 57 to 58%, £6 7s. 6d. per ton; carb. ash, 48%, £5 9s. 9d. per ton; 58%, £6 12s. 9d. per ton; ammonia ash, 58%, £6 7s. 6d. per ton; all net cash.

For prime brands a considerable premium on above figures has to be paid.

Soda crystals are not active, but a fair trade passing at £3 10s. to £3 12s. 6d. per ton, less 5%, while orders at a shade under the lower figure have had to be returned unfilled.

Caustic soda is very flat, but at the same time, there are practically no secondhand lots offering, so prices are nominally unchanged as follows: 60%, £9 2s. 6d.; 70%, £10 5s.; 74%, £11 5s.; 76%, £12 5s. to £12 10s. per ton. All net cash, for parcels under 10 tons 5s. per ton extra is charged.

Bleaching powder is steady, but orders not very plentiful. On the spot hardwood packages are quoted at £7 15s. to £8 per ton, net cash, for all quarters except United States and Canada.

Bicarb soda is meeting with a fair demand at £6 15s. to £7 per ton, less 2 1/2% for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia is quiet, and only a limited trade passing. Quotations are nominally about £10 8s. 9d. to £10 10s. for good grey 24%, and £10 15s. to £10 17s. 6d. for 25%, both in double bags, less 2 1/2% f. o. b. here.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Deadwood, Dak., Pittsburg, St. Louis, London and Paris, see pages 294 and 295.]

NEW YORK, Friday Evening, March 4.

The mining market this week shows but little change from the condition last reported. It has been dull and featureless. More life is noted in some of the gold properties, such as Standard. The total number of shares sold during the week at the Consolidated Stock and Petroleum Exchange was 28,645 against 33,090 last week.

There has been a better demand for most of the Comstocks and prices are slightly higher. We note sales of 220 shares of Consolidated California and Virginia at \$4.60@4.65; 350 shares of Ophir at \$2.80@2.90; 375 shares of Savage at \$1.15@1.25; 200 shares of Sierra Nevada at \$1.25@1.50; 300 shares of Best & Belcher at \$2.25@2.35; 300 shares of Exchequer at 40c.; 400 shares of Mexican, \$1.85@2; 300 shares of Potosi at \$1.30 @ \$1.40; 400 shares of Utah at 35@40c.; 200 shares of Union Consolidated at \$1.50@1.55; 200 shares of Segregated Belcher at 60c.; 500 shares of Scorpion at 30c. The following stocks show sales of only 100 shares each: Belcher at \$1.25; Gould & Curry at \$1.45; Hale & Norcross at \$1.90; Comstock Tunnel at 17c.

The Tuscaroras also appeared in better demand. In another column will be found the latest information from the mines. During the week there were sales of 300 shares of Commonwealth at 15c. and 700 shares of Navajo at 10c.

The California stocks were among the most popular, and show fairly heavy transactions. Brunswick Consolidated was bought by Mr. H. R. Lounsbury. During the week 15,700 shares changed hands at 11@12c. Superintendent Fitzgerald writes from Grass Valley under date of the 23d ult.: "The improvement at the mine continues. The hanging wall ledge has come in and is now 10 ins.; it looks as if it would widen in depth. The foot wall still shows the same kind of ore. I think in about 10 ft. both streaks will come together. The hanging ledge looks well and carries sulphurets and galena. The outlook is favorable, as the deeper we get the better the mine looks. If it would only continue it would take but a short time to make a first-class milling proposition. The shaft has been advanced 8 ft. during the past week, making a total of 536 ft." Of Belmont 800 shares changed hands at 60@61c. There was a sale of 100 shares of Bulwer at 45c. and 50 shares of Plymouth at \$2. Standard, owing to the favorable reports received from the superintendent, was in considerable request during the week. Sales aggregated 1,100 shares at \$1.35@1.50.

Among the Black Hills stocks there were sales of 1,000 shares of Caledonia at 94c.@\$1, and 300 shares of Deadwood Terra at \$1.90@2.

The Colorado stocks were rather quiet this week. Leadville Consolidated shows sales of 1,300 shares at 23c.@24c. Robinson Consolidated 600 shares at 44c.@47c. There was a single sale of Adams at \$1.25.

Horn Silver was in some demand, 1,450 shares being sold at \$3.75@3.90.

Alice was dealt in to the extent of 300 shares at 80c.

Phoenix of Arizona was quiet, the total sales aggregating only 700 shares at 49@55c.

Denver.

Prices and sales for the week ending February 27th

Company.	Open- ing.	H.	L.	Clos- ing.	Sales.
Allegany.....	09 1/2				
Amity.....	02	03	02	01 1/2	15,400
Bangkok-C.B.....	05 1/2	07 1/2	05 1/2	06	10,800
Bates-Hunter.....					
Brownlow.....	04	06	04	03 1/2	4,100
Calliope.....	15	15	14	14 1/2	600
Claudia J.....	03	03 1/2	02 1/2	03	51,300
Cash.....	10			08	
Clay County.....	30a				
Emmons.....	48 1/2	48	45 1/2		2,000
Gettysburg.....	25	26	24		2,700
Gold Rock.....	45	50	45	44	2,600
Leavenworth.....	06 1/2	06	06	05	100
Little Rule.....	9a			40	
Lexington.....	40	42	40	40	1,300
May-Mazappa.....	85	90	86	82	3,800
Matchless.....					
Oro.....	100	100			100
Pay Rock.....	03 1/2	06	05	05	14,000
Puzzler.....	02			02	
Paul Gold.....	09	10	10	08	1,100
Reed-National.....					
Rialto.....	11a	110	110		500
Running Lode.....	40a				
Whale.....	03 1/2	03	03	03	300
Bal. Smuggler.....	16a	15	15	15	100
Sutton.....	23	23	23	23	100
Prospects.					
Argonaut.....	15	16	15	15	700
Big Indian.....					
Big Six.....	04 1/2	04 1/2	04 1/2	04 1/2	100
Century.....	06	09	05	05	25,700
Diamond B.....	04	04 1/2	04	04	14,800
Nat. G. & Oil Co.....	07 1/2	09	07 1/2	08	17,400
Golden Treasure.....	05	05	05	05	5,000
Ironclad.....	12 1/2	15	13	12	4,000
John Jay.....	01a	1 1/2	1 1/2		200
Justice.....	18	20 1/2	18	18	12,200
Morning Glim.....	45	45	44	42	3,300
Park Consolidated.....	07 1/2			06	
Potosi.....	01 1/2			01 1/2	
Total.....					197,300

Buyer 30, †Buyer 60. ‡Seller 60. §Seller 30. a Asked.

Boston.

March 3.

(From our Special Correspondent.)

There has been a more cheerful feeling in copper circles the past week, and the market, under the rumors of a combination to control the production of copper during the coming year, has given operators more courage, and orders to purchase stocks have been quite plenty, while the offerings have been light, resulting in advancing prices for nearly the whole list.

Boston & Montana advanced from \$32.62 1/2 to \$36. The large short interest in this stock doubtless was a somewhat potent factor in the advance. Butte & Boston was also in better demand and advanced from \$13.75 to \$15.50.

Centennial was quite active, selling up to \$9%, an advance of 1% from the lowest price of the week. This stock has been largely oversold, and on any active demand for it readily advances.

Osecola advanced from \$25 1/2 to \$28, with good buying by parties who have confidence in its ability to earn and pay fair dividends.

Franklin recovered from its decline of last week and sold up to \$12, a gain of \$1. Kearsage has ruled quiet, but advanced on small sales to 11 1/2. Atlantic also gained \$1, and sold at \$10. Calumet & Hecla advanced to \$260, a gain of \$5, on small sales. Tamarack sold up to \$159, a gain of \$9 over last week. Allouez advanced to \$1 1/2, with later sales at \$1 1/2. National sold at \$1. Bonanza at 45c. and Santa Fe at 22 1/2 c. We hear of sales of Quincy at \$112, the stock being in good demand on the street. There is little more inquiry for silver stocks. Catalpa sold at 20@22 1/2 c. and Crescent at 12 1/2 c. Napa quicksilver was quite active at \$5@5 1/2.

San Francisco.

Feb. 27.

(From our Special Correspondent.)

The general action of the market during the past week indicates that hidden forces are at work to depress prices. The heavy break in the assay values of Con., Cal. & Virginia ore, albeit good ore is showing on every level of the bonanza mine, coupled with the fact that a large number of scales recorded, particularly of North End stocks, were "cshh," appears significant. Most of the brokers hold considerable stock, and yet in the face of a sharp decline along the line of Comstocks the offerings have been very light.

The contest for control of the Hale & No-cross mine has not prevented the stock from sharing in the general depression of values. The "reform" party of brokers is day by day receiving from holders of Hale & No-cross stock the assurance that they will be well supported at the coming election, but as some, at least, of the brokers in the combine are working from a purely selfish motive, and desire not so much to purge wholesale corruption from the administration of the mining companies, but only to force the purchase of stock in the Board, it is not unlikely that the combine will be weakened by the defection of some of the members.

The sales of North End Comstocks have been steady throughout the week, without being large. Consolidated California & Virginia, quoted a week ago at \$5, sold to-day down to \$4.35, with small offerings. Ophir at \$2.70 has shown a decline in the six days of 20c., and Mexican at 70 cents, Sierra Nevada at \$1.35, Union Con. at \$1.40, Scorpion at 15 cents, and Utah Con. at 30 cents, have shown a decline of from 5 to 15 cents.

The middle group of Comstocks have, for the most part, been in fair demand at the reduced rates that have been ruling. Chollar was quoted this morning at \$1.10; Gould & Curry at \$1.35; Hale & No-cross at \$1.40; Potosi at \$1.10; Savage at \$1.05.

The Gold Hill and South End Comstocks have sold steadier than the balance of the market, but not from any superior claim or attention, they evidently being outside the pale of manipulation. Alta sold this afternoon for 90c.; Alpha, 35c.; Belcher, \$1.10; Bullion, 70c.; Crown Point, 90c.; Lady Washington, 20c.; Overman, 50c.; Silver Hill, 10c. and Yellow Jacket, 70c.

Scattering sales continue to be made in the outside stocks, but there has been no steady demand. Bodie is sold for 45c., a decline during the week of 15c., despite favorable reports from the mine. Mono sold for 80c., and Bulwer 40c. Of the Tuscaroras, Commonwealth sold to-day for 15c., Del Monte for 40c., Nevada Queen, 25c., and North Commonwealth, 30c. In the Quijota group Crocker has been in some demand at 5c., and Peerless at 5c.

SAN FRANCISCO, March 4—(By Telegraph).—To-day's opening quotations are as follows: Best & Belcher, \$2.30; Bodie, 65c.; Belle Isle, 25c.; Bulwer, 45c.; Chollar, \$1.25; Consolidated California & Virginia, \$4.45; Eureka Consolidated, \$2; Gould & Curry, \$1.45; Hale & No-cross, \$1.85; Mexican, \$2.05; Mono, \$1.10; North Belle Isle, 15c.; Navajo, 5c.; Ophir, \$3.05; Sierra Nevada, \$1.75; Union Consolidated, \$1.60; Yellow Jacket, \$1.20.

St. Louis.

March 2.

(From our Special Correspondent.)

Mining stocks were active this week though prices were rather weak and declining. All the good news brought in from the mines had little effect on the local quotations, and while some few properties have recovered their lost ground some-

what, yet on the whole prices sagged considerably. The failure of the Adams to pay its usual dividend, together with the action of the Board of Directors of the Granite Mountain in declaring only a 20c. dividend had a depressing effect on all quotations. Later, however, the tone has been much better and it looks as though better prices will prevail in the next few days.

The failure of the Granite Mountain Company to declare 25c. dividend was a matter of surprise to every trader and speculator in the market. The cause given was that the heavy improvements made last month, together with the decline in silver, had made the net earnings of the mine much smaller. The improvements referred to are the ten stamps and four new roasters added to mill "C" and the putting in of a new hoist, involving an outlay of \$150,000.

The stock opened at \$17, and on the bad news becoming known fell to \$15. Ten shares sold at the opening figure, later 60 shares sold at \$14.25, and on Friday small stockholders sold out 325 shares at \$13.50. That was the lowest point reached, as on Saturday the stock sold at \$14.75 (15 shares), and on Monday 20 shares brought \$13, the closing figure.

Adams fell from \$1.25 to 75c. On the opening 1,200 shares sold. On Friday 100 shares sold at \$1.10, the market closing at 90c. Saturday saw the stock go to 82½¢@90c. on a 300 share sale, and on Tuesday 500 shares went for but 75c. To defend itself the Board of Directors has issued a circular, giving as reasons for not declaring the dividend the decline in silver, the heavy taxes, and costs of a lawsuit payable in February, and the non-working of the smelter due to the wet ore.

Central Silver opened on a sale of 4,000 shares at 16½¢@17½¢. It sold on the following day at 16½¢@18½¢, on sales of 5,500 shares, and later 300 shares sold at 17½¢; 2,000 shares sold on Monday at 17½¢, and on Tuesday the stock opened at 18½¢, but good news from the mine brought the stock up to 21½¢, the closing figure; sales, 1,200 shares.

Elizabeth sold 600 shares on the opening at 42½¢@40c. and later 2,500 shares sold at 40¢@38½¢. On Saturday 100 shares brought 41½¢, and on Monday 200 shares sold at 42½¢@41½¢. A slight boom was experienced on Tuesday, 700 shares selling at 43½¢@46½¢, but the movement did not last long, the market closing at 42½¢.

Bi-metallic opened at \$18 on a sale of 40 shares, but soon fell to \$17, sold later at \$18, 60 shares going, 60 more shares went on the following day at \$18. The market is now quiet at 18.50 bid.

American & Nettie declined from 97½¢ to 92½¢. Sales were 100 shares at 97½¢; market appears weak, and was at one time quoted at 90c.

Little Albert was dealt in this week, selling on Friday at the opening figure [6½¢.] 500 shares; market quiet now at 6c.

Five hundred shares of Breen at 2c., and 200 shares of Yuma at 9¢@8½¢, also sold this week.

Closing quotations on other stocks were: Hope, \$2; Leo, 9c.; Montrose, 14c.; Pat Murphy, 4c.; Yuma, 8c.

MEETINGS.

Atlantic Mining Company, at the office of the company, No. 76 Wall street, New York, March 8th, at 12 o'clock noon.

Colorado Coal and Iron Company, at the office of the company, in Pueblo, Colo., April 4th, at 1 P. M.

Clay County Mining and Milling Company, at the office of the company, Mining Exchange Building, Denver, Colo., March 9th, at 10 A. M.

Denver Natural Gas and Oil Company, at the office of the company, No. 1540 Lawrence street, Denver, Colo., March 8th, at 2 P. M.

Emmons Mining Company, at the office of the company, room 44, Jacobson Building, Denver, Colo., March 7th at 4 P. M.

Gold Rock Mining and Milling Company, at the office of the company, Mining Exchange Building, Denver, Colo., March 9th, at 3 P. M.

Globe Copper Company, at the office of the company, No. 76 Wall street, New York, March 8th, at 1 P. M.

John Duncan Land and Mining Company, at Germania Hall, Hancock, Mich., March 7th, at 2 P. M.

May-Mazepa Consolidated Mining and Milling Company, at the office of the company, Mining Exchange Building, Denver, Colo., March 7th, at 3 P. M.

Midas Petroleum and Improvement Company, at the office of the company, in Pittsburg, Pa., March 9th, at 1 P. M.

South Fork Consolidated Mining Company, at the office of the company, Nos. 22-24 E. First South Street, Salt Lake City, Utah, March 11th, at 8 P. M.

St. Louis Copper Company, at the office of the company, room 40, No. 244 Washington street, Boston, Mass., March 8th, at 3 P. M.

St. Mary's Canal Mineral Land Company, at the office of the company, in Boston, Mass., March 8th, at 12 o'clock noon.

St. Mary's Copper Mining Company, at the office of the company, room 40, No. 244 Washington street, Boston, Mass., March 28th, at 12 o'clock noon.

DIVIDENDS.

Napa Consolidated Quicksilver Mining Company, dividend No. 44, of 10 cts. per share, \$10,000; also an extra dividend of 10 cts. per share, \$10,000, payable April 1st, at the office of the company in Boston, Mass. Transfer books close March 15th, and reopen April 2d.

ASSESSMENTS.

COMPANY.	No.	When levied.	DT'nd't in office.	Day of sale.	Amt. per share.
Alki Cons., Cal.....	2	Jan. 16	Feb. 20	Mar. 9	.02
Blue Jay, Utah.....	1	Jan. 18	Feb. 15	Mar. 7	.00½
Bullion, S. Dak.....	8	Jan. 20	Feb. 20	Mar. 8	.03
Butte Queen, Cal.....	2	Jan. 26	Feb. 27	Mar. 18	.04
Challenge, Con. Nev.	10	Jan. 14	Feb. 17	Mar. 9	.25
Con. Imperial, Nev.	32	Jan. 22	Feb. 25	Mar. 15	.25
Con vention G., S. Dak.....	1	Jan. 16	Feb. 20	.....	.001
Evening Star, Cal.....	3	Jan. 20	Feb. 22	Mar. 12	.06½
Exchequer, Nev.....	32	Jan. 22	Feb. 25	Mar. 17	.25
Found Treasure, Nev.....	7	Jan. 19	Feb. 24	Mar. 17	.50
Golden Fleece Gravel, Cal.....	16	Jan. 30	Mar. 24	May 7	5.00
Gray Eagle, Cal.....	1	Jan. 11	Feb. 15	Mar. 7	.02
Guasucaran & California, B. C.....	6	Feb. 9	Mar. 15	Apr. 5	3.00
Imperial, Nev.....	33	Jan. 23	Feb. 25	Mar. 15	.03
Martin White, Nev	27	Jan. 8	Feb. 11	Mar. 12	.25
Mexican, Nev.....	44	Jan. 14	Feb. 17	Mar. 10	.25
Middle Creek Gold, B.; Col.....	2	Jan. 16	Feb. 20	Mar. 22	.05
Modoc Chief, Idaho	1	Jan. 28	Mar. 21	Apr. 11	.00½
Montreal, Utah.....	1	Feb. 17	Mar. 26	Apr. 13	.10½
Northwestern G. & S. B., Col.....	4	Jan. 15	Feb. 24	Mar. 16	.25
Norway, Utah.....	9	Dec. 24	Feb. 1	July 21	.02
Occidental Con., Nev	9	Jan. 11	Feb. 16	Mar. 10	.25
Overman, Nev.....	63	Feb. 10	Mar. 16	Apr. 6	.50
Pasadena, Utah.....	1	Jan. 12	Feb. 15	Mar. 10	.00¼
Pin Hill.....	1	Feb. 11	Mar. 24	Apr. 15	.04
San Francisco M. & M., Cal.....	1	Jan. 12	Feb. 16	Mar. 8	.02
Savage, Nev.....	78	Feb. 2	Mar. 8	Mar. 28	.50
Sierra Nev., S. Nev.	101	Feb. 1	Mar. 4	Mar. 24	.30
Teresa, Mex.....	7	Feb. 18	Mar. 21	Apr. 6	.10
Weldon, Ariz.....	5	Feb. 9	Mar. 15	Apr. 14	.05
Yellow Jacket, Nev	.....	Feb. 2	Mar. 4	Apr. 2	.50

PIPE LINE CERTIFICATES.

A special report shows that in the oil fields of New York, Pennsylvania, West Virginia and Southeastern Ohio there were 180 wells completed during February, with 9,974 barrels of new production. Of the entire number there were 32 that were dry and five that proved gas producers. Compared with the preceding month, there is a decline of three wells, 2,335 barrels production and five dry holes. The new work, on the contrary, shows a small increase, the figures for the last day of February being 130 rigs and 270 drilling wells, a total of 400. This represents an increase of five rigs and 19 drilling wells, or a total of 24 over the results recorded on the last day of January. The fields of northwestern Ohio and Lima in February completed 95 wells with 4,735 barrels production and 15 dry holes. The increase is 17 wells completed, 1,540 barrels production and four dry holes. There were 22 wells abandoned during the month. In new work there was an increase of 44 rigs and wells drilling, with indications for an active spring campaign. The figures for February 29 were 136 rigs and 90 drilling wells, as against 103 rigs and 79 drilling wells on January 31.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales
Feb. 27.....	58½	59½	57½	57½	158,000
29.....	58½	59½	58	58½	28,000
Mar. 1.....	58	62	58½	58½	17,000
2.....	59½	59½	59½	59½	5,000
4.....	59½	59½	57½	59½	9,000

Total sales in barrels..... 215,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Feb. 27.....	.....	.....	.....	.....	.....
29.....	.....	.....	.....	.....	.....
Mar. 1.....	57½	57½	57½	57½	3,000
2.....	.....	.....	.....	.....	.....
3.....	59	59	59	59	10,000
4.....	57½	57½	57½	57½	2,000

Total sales in barrels..... 15,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 4.

PRODUCTION OF COKE on line of Pennsylvania R. R. for the year ending February 27th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 113,464 tons; year, 94,062 tons; to corresponding date in 1891, 639,917 tons.

PRODUCTION OF BITUMINOUS COAL for week ending February 27th, and year from January 1st.

EASTERN AND NORTHERN SHIPMENTS.

	1892.		1891.	
	Week.	Year.	Week.	Year.
Phila. & Erie R. R.....	1,454	15,106	27,247	27,247
Cumberland, Md.....	63,418	505,960	618,838	618,838
Barclay, Pa.....	13,651	36,364	26,746	26,746
Broad Top, Pa.....	16,720	95,480	109,360	109,360
Clearfield, Pa.....	65,981	574,013	755,087	755,087
Allegheny, Pa.....	25,776	183,308	218,648	218,648
Beach Creek, Pa.....	142,071	373,730	399,040	399,040
Pocahontas Flat Top.....	54,638	413,508	355,202	355,202
Kanawha, W. Va.....	57,428	381,016	336,242	336,242
Total.....	325,137	2,576,545	2,846,410	2,846,410

WESTERN SHIPMENTS.

	1892.		1891.	
	Week.	Year.	Week.	Year.
Pittsburg, Pa.....	22,490	216,114	180,112	180,112
Westmoreland, Pa.....	31,950	292,640	340,723	340,723
Monongahela, Pa.....	7,354	73,566	97,289	97,289
Total.....	61,794	582,320	618,124	618,124

Grand total..... 386,931 3,158,865 3,464,534

*Week ending February 21st.

†Estimated.

Anthracite.

The market during the past week, while showing firmness, has been dull. Owing to the cold snap, there has been a slightly increased demand which will show its effects in the coming week rather than this. Stocks on hand have not increased and the operators seem to be holding closely to their allotment. Interest has centered, as in the past week, on the proposed compact between the individual operators and the Reading combination. It is said that the proposal to the individual operators is meeting with much favor among those along the lines of the combined roads, and it is not thought that the advances of the Pennsylvania system, if they have made any, will affect the ultimate signing of the contracts. The terms of production, which will undoubtedly be based on the maximum output of the collieries, has not yet been arranged, but one prominent operator said it must be at least 75%.

As regards the Pennsylvania's action it is certain that it is showing considerable activity in the anthracite regions, particularly in Luzerne County, where it, or parties supposed to be working for it, is constructing a bridge over the Susquehanna at Wilkesbarre, and where its representatives have asked for terms for the output of individual collieries, demonstrating that it is intending a lively competition with the Reading combination in this section. Whatever uncertainty as to the future of the Reading deal may be expressed by certain operators the Coxe Brothers seem to have plenty of confidence. They have even secured two of the Pardee collieries, Hollywood and Latimer. This, it is safe to say, they would not do did they not believe that the market will take an upward tendency. This augmented price proposed and seemingly guaranteed by President McLeod, of the Reading, will be increased gradually; that is to say, the probable maximum raise to \$4.50 for Stove coal will be divided over a year's time, so that the higher prices will not be severely felt by the consumer.

The New York State senatorial committee to examine into the big Reading deal met on Monday morning. President Sloane, of the Delaware, Lackawanna & Western, and Second Vice-President E. R. Holden, who has charge of the road's coal interests, were important witnesses. Both, as did other officials, disclaimed any knowledge of a coalition between the various roads. Mr. Holden was asked whether or not there had been any change of prices by his road, which he had stated was a direct coal producer; he said that there had not been, since October; that that matter was arranged between March 1st and May 15th by schedule. When asked again if he thought prices would be raised, he said it was but natural to seek the highest prices obtainable.

On Thursday afternoon the committee of the Pennsylvania Legislature met. Neither Mr. Powderly nor Mr. Cassatt, nor any of the Pennsylvania officials were present. Mr. A. A. McLeod, president of the Reading, was there, as was Attorney Johnson, of that company. The leases of the Lehigh Valley and of the Jersey Central railroads were given to Attorney-General Hensel, but not for publication. Attorney Johnson said that the selling price of coal at local points in Pennsylvania had varied during 1891 from \$1.75 to \$1.92, whereas at tide water it had varied from \$1.57 to \$1.74; that during the year the price at tide water had been from 13 to 17c. less per ton than at the collieries. It was to avert this and to do away with middlemen that the Reading's action was taken.

In coal stocks and those of the roads likely to be affected by the consummation of the various rumors, which have been spread broadcast during the past year, there has been lively trading; and this particularly in Delaware & Hudson. It has been rumored that a combination formed by the New York Central, Pennsylvania and Erie roads, similar to that of the Reading, was seeking the control of the Delaware & Hudson. This rumor, which has excited the street to a great extent, cannot be confirmed. Officials are reticent and claim, and possibly quite correctly, that they know nothing of such a movement. New York & New England as the distributing road for such a combination has been affected also, 162,000 shares being disposed of on Thursday forenoon, before the "tip" that Dr. Dr. W. Seward Webb was to be made president of that road in the Vanderbilt interest was officially denied by his brother, H. Walter Webb, of the New York Central. This denial sent the stock down again, though the coal stocks remained firm.

Philadelphia & Reading has been even more active during the past week than in the week before; 304,472 shares were sold on the New York exchange in five days and 118,231 shares in Philadelphia in the same time. The highest point reached was on Monday, when it reached \$60%, falling off one point during the days following and losing to-day at \$58½%.

Delaware, Lackawanna & Western was also largely traded in, 94,212 shares being disposed of in five days; 64,770 of them on Monday, when it rose with a bound from \$161 to \$167½, receding, however, to \$165½, at which figure it closed. During the week it has gradually fallen until it closed to-day at \$163.

Delaware & Hudson Canal took its spurt on Monday also. Its sales on that day reached 36,753 shares, opening at \$140 and reaching \$145½. The trading on the days following was light, due to contradictory rumors and uncertainty. It closed to-day at \$141.

Bituminous.

The soft coal trade has been as dull as the anthracite during the past week. It is rumored, however, but these rumors cannot be confirmed, that several large contracts have been made at last year's rates: \$2.50 at Baltimore, \$2.60 at Philadelphia, and \$3.15 at South Amboy. This is a period of suspense among bituminous men. The contract season, when the coming year's business will be virtually settled, is coming on and the action hoped for from the Seaboard Steam Coal Association is anxiously awaited. It is hinted that the various soft coal roads, the Pennsylvania, the Baltimore & Ohio, the Chesapeake & Ohio and the Norfolk & Western will be asked, with much hope of success, to assist the Association in keeping up prices by placing various difficulties in the way of those who have temerity to cut rates.

It is reported that it has been proposed to form a soft coal trust similar to the anthracite combination, and that the matter was placed under the consideration of Drexel, Morgan & Co., who absolutely refused to enter into it. It was then referred to Philadelphia capitalists, and, it is said, to the Pennsylvania Railroad, who have the matter still under consideration. One prominent operator in soft coal said yesterday that while such a combination had been proposed it would be absolutely impossible to consummate, as bituminous interests were too large, and the coal itself was found in too great abundance, while the anthracite fields were comparatively small and adjacent.

There has been considerable difficulty in the lower ports in obtaining ocean freights, owing to the high winds which have prevailed recently. Rates have been the same however; from Philadelphia 80¢ to 85¢, to Boston and 75¢, to Sound ports; from Baltimore 5¢ higher. There is absolutely nothing new otherwise.

NOTES OF THE WEEK.

The Salthurgh Coal Company, in Westmoreland County, Pa., may be placed in the hands of a receiver, as W. A. Love, the owner of 55 shares of stock, has made application to have it placed in the hands of one, claiming, and being supported in his claims by other interested parties, that the property has been maladministered. He claims that \$1,000,000 of coal has been taken from the property, but without apparent profit. He claims that the profits have been converted to the officers' own uses and the defalcation covered by false entries to the extent of \$100,000; that \$28,475 was paid illegally to O. W. Shipman, and that an illegally issued mortgage for \$250,000 had been made in favor of the Fidelity Insurance and Investment Company of Philadelphia. The officers of the company are B. K. Jamison, president; F. W. Ralston, treasurer; Frank R. Shattuck, secretary; W. H. Stewart, J. H. Kershaw, Morton McMichael and Victor Guillon, directors, all of Philadelphia.

Buffalo. March 3.

(From our Special Correspondent.)

In lieu of my customary letter I send to-day the annual statement of Mr. William Thurstone, the secretary of the Merchants' Exchange, extracts from the official figures of the coal commerce, etc., of Buffalo, for 1891, with comparisons with previous years:

The anthracite and bituminous coal trade of Buffalo, N. Y., for the past four years is shown by the following figures, the tons in all cases being net tons of 2,000 lbs.

IMPORTS BY CANAL.				
	1888.	1889.	1890.	1891.
Anthracite, tons...	149,474	100,885	41,266	817
Bituminous, tons...	7,452	11,673	25,872	34,060
EXPORTS BY CANAL.				
	1888.	1889.	1890.	1891.
Anthracite, tons...	2,541,905	2,151,670	2,152,810	2,358,895
Blossburg, tons*	5,000	5,000	5,000	7,000
IMPORTS BY RAILROADS.				
	1888.	1889.	1890.	1891.
Anthracite, tons*	4,399,541	4,237,685	4,308,424	4,506,987
Bituminous, tons...	1,802,823	2,198,327	2,344,467	2,405,084
Blossburg, tons*	22,500	22,500	25,600	23,000
EXPORTS BY RAILROADS.				
No statement or estimate to hand of the movement.				
RECAPITULATION.				
Total imports anthracite, tons...	4,549,015	4,349,690	4,349,690	4,507,804
Total imports bituminous, tons...	1,809,275	2,198,327	2,344,467	2,405,084
Total imports...	22,500	22,500	25,000	23,000
Total exports anthracite, tons...	2,541,905	2,151,670	2,152,810	2,358,895
Total exports bituminous, tons...	5,000	5,000	5,000	7,000

*Partly estimated.

ANTHRACITE WHOLESALE CIRCULAR PRICES.

The following were the circular wholesale prices of anthracite coal during 1891 per gross ton:

1891.	Free on board vessels.				On cars at Buffalo or Suspension Bridge.				
	Grate.	Egg.	Stove.	Chestnut.	1891.	Grate.	Egg.	Stove.	Chestnut.
April 22d.	4.45	4.55	4.55	4.55	Jan. 1st.	4.15	4.25	4.25	4.50
June 1st.	4.60	4.70	4.70	4.70	June 1st.	4.30	4.40	4.40	4.40
July 1st.	4.70	4.80	4.80	4.80	July 1st.	4.40	4.50	4.50	4.50
Sept. 1st to close.	4.80	4.90	4.90	4.90	Sept. 1st to close.	4.50	4.60	4.60	4.60

ANTHRACITE—RETAIL PRICES.

1891	Grate.	Egg.	Stove.	Nut.	Pea.	Blossburg.
Jan. 1....	\$4.75	\$5.00	\$5.00	\$5.00	\$3.75	\$4.00
May 1....	4.50	4.50	4.50	4.50	3.75	4.00
June 1... 4.75	4.75	4.75	4.75	3.75	4.00	
Oct. 1 to close.	5.00	5.00	5.00	5.00	3.75	4.00

BITUMINOUS PRICES.

The range of prices during 1891 for bituminous, delivered to manufactories, gas works, propeller lines, tugs, etc., was from \$2 to \$2.75 per net ton, in car lots, according to description. The price at retail for choice for family use was \$6 per net ton delivered.

DISTRIBUTION OF EXPORTS BY RAIL.

The distribution of exports of coal by lake from this port, during the year 1891, was as follows:

From Buffalo to: Net tons	From Buffalo to: Net tons
Chicago..... 957,805	Portage..... 2,210
Milwaukee..... 508,140	Bay Mills..... 1,960
Toledo..... 64,621	Dallas Bay..... 1,000
Racine..... 30,510	Mackinaw..... 825
Green Bay..... 29,015	Manistique..... 275
Superior..... 163,075	Put in Bay..... 250
Saginaw..... 23,640	Traverse City..... 350
Kenosha..... 7,860	Algonac..... 600
Manitowoc..... 3,850	East Tawas..... 640
Menominee..... 7,775	Deperre..... 1,225
Ludington..... 1,160	Lake Linden..... 463
Kincardine..... 1,200	Bay City..... 13,335
Detroit..... 24,590	Port William..... 20,860
Ashtabula..... 12,075	Marquette..... 20,935
Washburn..... 8,000	Cheboygan..... 300
Duluth..... 257,625	Amherstburg..... 5,300
Gladstone..... 35,170	Owen Sound..... 1,000
Hancock..... 3,080	Marine City..... 1,160
Escanaba..... 4,630	St. Ignace..... 300
Houghton..... 4,370	Port Arthur..... 3,860
Alpena..... 1,030	Sandusky..... 206
Au Sable..... 500	Port Colborne..... 240
Windsor..... 2,785	Sault Ste. Marie..... 8,475
Huron O..... 300	Sheboygan..... 17,175
St. Clair..... 1,650	Oscoda..... 200
Kelly Island..... 810	Port Huron..... 3,725
Marquette..... 4,650	

LAKE FREIGHTS ON COAL FROM BUFFALO TO CHICAGO AND OTHER PORTS.

The following statement shows the range of freight rates on coal per net ton, from Buffalo to the ports named, during the season of 1891:

Month of May.—60c. to Chicago, 50c. to Milwaukee, 40c. to Duluth and Lake Superior ports, 30c. to Toledo, 25c. to Detroit, 60c. Racine, and 40c. to Saginaw—same rate all the season.

Month of June.—60c. to Chicago, Milwaukee, Green Bay and Racine, 30c. to Detroit and Toledo, 40c. to Lake Superior ports and Duluth.

Month of July.—60¢ to Chicago, Milwaukee, Green Bay and Racine, 40¢ to 30c. to Duluth and Lake Superior ports, 30c. to Sandusky and Toledo, 25c. to Detroit and Bay City, and 40c. to Washburn.

Month of August.—50c. to Chicago, Milwaukee, Green Bay and Racine, 30¢ to 40c. to Duluth and Lake Superior ports and Washburn, 30¢ to 25c. to Toledo and Bay City, 25c. to Detroit.

Month of September.—50¢ to Chicago, Milwaukee and Racine, 40c. to Green Bay, 30¢ to 25c. to Duluth and Lake Superior ports, 25c. to Toledo, Detroit and Bay City.

Month of October.—40¢ to Chicago, Milwaukee and Green Bay, 25c. to Duluth and Lake Superior ports, 20c. to Toledo, 20¢ to 25c. to Detroit, 45¢ to 50c. to Racine, 25¢ to 30c. to Bay City.

Month of November.—60¢ to Chicago, Milwaukee and Green Bay, 65c. to Racine, 25¢ to 10c. to Duluth and Lake Superior ports; 20c. to Toledo and Detroit and 25c. to Bay City.

Month of December.—A few loads at \$1 to Chicago and Milwaukee and \$1.25 to Racine.

Boston. March 3.

(From our Special Correspondent.)

During the week there has been an improved inquiry for coal. Not one vessel with a cargo of coal has arrived during the past three weeks. Dealers' stocks are commencing to run low, and consequently they now need, or at least will shortly need, some coal. Dealers, of course, will buy as little as possible until the coal combination has completed its organization. The price of anthracite coal is unchanged.

We quote f. o. h. prices net at New York: Stove, \$3.75 to \$3.90; egg, \$3.60 to \$3.75; free broken, \$3.50 to \$3.60; chestnut, \$3.25 to \$3.40; Lykens Valley, broken, \$4.00; egg, \$5; stove, \$5.40; chestnut, \$4.35.

There have been no new developments of importance during the week in bituminous coal, or

at least they have not been made public. The mills are still talking of contracts and are trying to find the bottom of the market. Dealers are still quoting \$2.50 Baltimore and \$2.60 Philadelphia f. o. b. at shipping port. Coal on cars here is quoted at \$3.70.

Freight rates are easy and unchanged. We quote: From New York to Boston 60¢ to 65¢; from Philadelphia to Boston, 80¢ to 85¢; from Philadelphia to Portland, 80¢; to Bath, 85¢; to Providence, 70¢; from Baltimore to Boston, 85¢ to 90¢; Newport News to Boston, 75¢; Sound ports, 65¢.

We have very recently had a heavy snow storm, which makes draining hard, consequently the retail companies have all their horses in use. There is no real activity to coal, however, as consumers seem to be quite well supplied. The retail coal dealers in this vicinity are at present very much interested in the subject of municipal coal yards, which is being agitated by the nationalists at the Massachusetts State house.

The committee on mercantile affairs has given several hearings on the subject. The Nationalists claim that by municipal coal yards consumers can be supplied at cost. One Boston dealer, who spoke against the scheme, said Boston consumes about 2,000,000 tons of coal a year, and to pay cash for that amount, buying, as the petition reads, all at one time, would necessitate an outlay of \$20,000,000.

We quote: Stove, \$5.50; nut, \$5.50; egg, \$5.25; furnace, \$5.25; Franklin, \$6.75 to \$7, all sizes; Lehigh egg, \$5.50; Lehigh furnace, \$5.50. Wharf prices are 50 cents less than the foregoing.

The receipts of coal at this port for the week ending February 20th were 30,902 tons of anthracite and 17,715 tons of bituminous against 9,472 tons of anthracite and 7,685 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 208,199 tons of anthracite and 81,514 tons of bituminous against 144,785 tons of anthracite and 145,743 tons of bituminous for the same time last year.

Chicago. March 2.

(From our Special Correspondent.)

Officials of the consolidated anthracite coal companies here state they have no information outside of the facts as published in the ENGINEERING AND MINING JOURNAL, excepting the receipt of a circular of prices which are \$5 net to anybody or for any amount and that deliveries are restricted to March and April. The promulgation of this has had a very decided tendency to harden prices, and a thorough canvass of the trade reveals no evidence of cutting the \$5 rate.

The larger outside trade is very dull; new business is light and will probably continue so for the remainder of the season. March, 1891, was the best retail month that the coal trade had during the year, and everything indicates that the current month will see a better trade at enhanced prices. The cold weather we experienced in January and February has exhausted stock in consumers' cellars and supplies are being freely ordered.

Bituminous coal is dull, flat, stale and unprofitable, and the market very largely overstocked on all grades. The heavy inflow of soft coal to Chicago is having a bad effect on prices, which are cut right and left. There is a large amount going into consumption, but the receipts are out of all proportion and railroad side tracks are lined with car coal. Demand for Brazil black coal has been better this week and one large mining company reports more orders to-day than for the whole of the previous week, but prices remain weak with a downward trend. In Illinois coal a similar tendency to lower prices is noted and quotations have been scaled down 10¢ to 25¢ a ton.

The coke trade is quietly but steadily expanding and is not subject to the fluctuations noticeable in soft coal. Demand is fair and prices on the Connellsville article are steady. Some grades of West Virginia coke are being offered in this market at very low figures, indeed remarkably low, if it is only a fair quality. What effect the blowing out of so many furnaces will have on values remains to be seen.

Quotations are \$4.65 furnace, \$5.05 foundry, Connellsville; West Virginia, \$3.90, furnace—\$2.10 foundry; New River foundry, \$4.90; Walston, \$4.65, furnace—\$5 foundry.

Circular prices are unchanged at the following rates: Lehigh lump, \$6.25; large egg, \$5; small egg, range and chestnut, \$5. Retail prices per ton are: Large egg, \$5.75; small egg, range and chestnut, \$5.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.15; Hocking Valley, \$3; Youghiogheny, \$3.25; Illinois block, \$1.90 to \$2; Brazil block, \$2.

Pittsburg. March 3.

(From our Special Correspondent.)

Coal.—The market since our last has undergone no particular change. The local demand was active and sales liberal; prices show no change. The Western and Southern markets are fairly supplied; prices have been uniform for some time. The February coal shipments were principally for the Southern market as follows: Cincinnati, 2,531,000 bushels; Louisville, 7,305,000 bushels; total, 9,836,000 bushels. The shipments in February last year were only 308,000 bushels; increase this year, 9,528,000 bushels. The ports and harbor are bare of coal; the continued good water enabled the coal men to ship as fast as loaded. Prices in

the lower markets are the same as quoted in our last.

Connellsville Coke—Trade continues moderately active. Shipments show a slight increase, at the same time the outlook is not a rosy one as regards the future. The dullness in the iron trade has caused the banking of a number of furnaces, with others to follow. Production and shipments keep up to the average, but there is a steady accumulation of stock coke in many localities. The car supply has been ample, and prices so far have been fairly maintained. Forty-three of the 84 plants in the region made 6 days; twenty, 5 days; fourteen, 4 days; seven remained idle. The Frick Company increased its average, making 4½ days against 4¼ days the previous week. All the ovens in blast of the McClure Coke Company were drawn six days last week, as well as the ovens of the Southwest Company. The following plants made five days: Whiting and Hecla No. 1, West Overton, Chester Percy, Great Bluff, Pennell, Emmer and Home. The shipments were 132,500 tons as follows: To Pittsburg, 1,859 cars; points west of Pittsburg, 3,900; east of Pittsburgh, 1,591 cars. Prices remain the same as those current for the last 14 months.

METAL MARKET.

NEW YORK, Friday Evening, March 4, 1892.
Prices of Silver Per Ounce Troy.

Feb.	Settling Exch'g.	London, Pence.	N. Y. Cents.	Value of sil. in \$1.	March.	Settling Exch'g.	London, Pence.	N. Y. Cents.	Value of sil. in \$1.
27	4.88	41½	90½	.699	2	4.87½	41½	90½	.703
29	"	"	"	"	3	"	41½	90½	.701
1	4.87½	41½	90½	.700	4	"	41½	90½	.700

Under the absorption of Government purchases and London shipments, the market has been steady with no particular disposition to advance or decline. The possibility of a conference has the moral effect to steady the market, but no definite information on this subject is yet made public.

The United States Assay Office at New York reports the total receipts of silver for the week to be 142,000 ounces.

Silver Bullion Certificates.

Date	Price.		Sales.
	H.	L.	
Feb. 27			
Feb. 29	90½		10,000
March 1	90½		10,000
March 2			
March 3			
March 4	90½		20,000
Total sales			40,000

Coinage of the United States Mints.

The following statement shows the coinage executed at the mints of the United States during February:

Denomination.	Pieces.	Value.
Double eagles	115,500	\$2,300,000.00
Eagles	84,500	845,000.00
Half eagles	65,260	326,300.00
Standard dollars	315,000	315,000.00
Half dollars	358,000	179,000.00
Quarter dollars	1,152,079	288,019.75
Dimes	810,000	81,000.00
Five cents	868,000	43,400.00
One cent	5,780,000	57,800.00
Total gold	265,220	\$3,473,400.00
Total silver	2,635,079	\$863,019.75
Total minor	6,618,000	\$101,200.00
Total coinage	9,548,099	\$4,437,619.75

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	72	75
Mexican dollars	70½	71½
Peruvian soles and Chilean pesos	48	50
English silver	4.83	4.90
Five francs	.93	.95
Victoria sovereigns	4.86	4.90
Twenty francs	3.86	3.90
Twenty marks	4.74	4.76
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.78	4.83
Mexican doubloons	15.50	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Fine silver bars	90½	91½

Copper.—The market has remained rather quiet, with but very little doing. It has now become known that during last week the Calumet & Hecla Company made a rather important sale to the consumers, which was kept secret for a little while, and it is surmised that only the larger manufacturers got copper at the price; but, anyhow, it is estimated that the total of the sale amounted to about 6,000,000 to 8,000,000 lbs. The open market has continued somewhat higher, and we have to quote from second hands and the smaller companies, about 10¢ to 10½¢. For casting copper the demand has not been so good, and prices were lowered to about 10¢ to 10½¢, according to brand and quantity.

There have lately been rumors of a combination for the restriction of production being formed, and

it is said that already most of the large producers have agreed to join in. Further details have not yet been made known, but we are told that the understanding is that the whole scheme is to be dependent on the foreign producers agreeing to do likewise. So far negotiations have been carried on in only an off-hand manner, as it has been the intention to first get the producers in this country together and then approach the foreigners.

It stands to reason that if such an arrangement can be made, that it ought to have some effect on prices, but we are not at all sanguine of the possibility of carrying through such a plan, considering that there are in this country so many producers, and such diverse interests. The larger Michigan companies can exist at present prices, and even return profits to their shareholders. Most of the smaller companies, however, are losing money already and all the Western producers are having the greatest difficulty in pulling through with copper ruling as at present. It certainly is not saving too much, in remarking that the bulk of them can produce only at a loss. Hitherto all similar undertakings have failed of success, and the collapse of the French syndicate a few years ago, which was also based on an artificial raising of prices by restricting production, is still fresh in the minds of all.

Heavy sales have been made in Europe of Anacanda matte, based on the price of B. S. and G. M. B. copper, for delivery over the whole of the year. The quantity contracted, according to reports which we have received, is about 15,000 tons. Considering these large sales and those of the Calumet & Hecla Company, both at very advantageous prices for the buyers, it would seem as if these two largest American producers had not such confidence in the success of the efforts to form the combination.

Trade reports from Europe are not at all favorable. The trade is operating with great caution and for the manufactured articles the demand is rather poor, so that most of the English smelters cannot work on full time. The speculative market has about held its own, with only small fluctuations, and closes at £44 5s. for spot and £44 15s. for three months prompt. For manufactured sorts, we quote: English tough, £46 10s. @ £47; best selected, £48 10s. @ £49; strong sheets, £58 @ 58 10s.; India sheets, £55 @ £55 10s.; yellow metal, 5½¢ to 5¼¢.

According to cables received, the statistics for the second half of February show a decrease of 600 tons.

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

To	Copper	Matte.	Lbs.	\$
To Liverpool	2,111 bags.		240,600	\$15,000
S. S. Servia	3,835 bags.		401,000	28,000
" Italy	566 bags.		108,807	7,900
" Dalfon		Copper.		
To Hamburg		1 cask.	1,250	\$131
S. S. Suevia		18 casks.	22,500	2,500
" Moravia		30 casks.	31,500	3,300
" Sheerness		100 casks.	125,000	13,750
" "		1,208 pigs.	205,150	19,000
" Scandia		395 pigs.	112,006	11,000
" "		36 ca.ks.	45,000	5,000
To Antwerp		Copper.		
S. S. Conemaugh		196 pigs.	64,581	6,600
To Bordeaux		Copper.		
S. S. Tancaville		20 bbls.	25,000	\$2,700
" "		228 bars.	63,862	6,300
" "		163 pigs.	56,003	5,900
To Havre		Copper.		
S. S. La Bretagne		230 pigs.	67,030	\$6,825
To Rotterdam		Copper.		
S. S. Washington City		63 bbls.	78,750	\$8,255
" Spaarndam		30 casks.	37,000	3,900
" "		843 bars.	77,119	8,194
" "		167 pigs.	44,847	4,500
" "		140 casks.	22,400	2,500

Tin remains dull, with business quite spasmodic. On the 2d instant about 200 tons of tin were done on the Metal Exchange, partly for June delivery, at 19 75¢, and second half of this year delivery at 19 85¢, but spot has hardly been influenced, and must still be quoted at 19 65¢ to 19 75¢. Consumption is not as good as it ought to be, but so far shipments from the East have been rather small, and for February amounted to only 625 tons to the United States and 1,050 tons to Great Britain, a total of 1,625 tons, against 1,935 tons last year. The visible supplies for the month of February show a decrease of 400 tons. It is anticipated that during March shipments from the East will be very heavy, and this will only be natural in view of the lightness of the shipments last month. To-day's closing prices in London are £89 10s. for spot and £89 17s. 6d. for three months.

Lead.—There has not been much doing, but prices have been rather firmer, producers not being anxious to sell. We quote 4 20¢ to 4 25¢. The foreign market is steady with a good business doing. Spanish being quoted at £10 15s. and English at £10 17s. 6d.

Chicago Lead Market.—H. P. Post telegraphs us as follows: "Market is quiet, the sales for the week were 300 tons at 4c. The closing price is 3 95c. bid and 3 97 5/8c. and 4c. asked."

St. Louis Lead Market.—Lead is very quiet and trading has been unusually light, the nominal value for both spot and future delivery is 3 95c., at which figure the last sales were made.

Spelter continues rather irregular, and galvanizers complain very much that they are poorly provided with orders ahead. For this reason they are buying very cautiously, the more so as they think by waiting a little longer they will be able

to get in at better prices. Production keeps up, and we quote 4 55¢ to 4 60¢. New York.

The foreign market has been very weak, and good ordinaries are to-day quoted at £21 in London against £21 5s. last week.

Antimony is flat and only a little business doing. We have to quote Cookson's 14 1/4¢ @ 15c, L. X. 12c. and Hallett's 10 1/4¢ @ 11c.

Quicksilver.—This market continues featureless. Quotations are: London, £7 2s. 6d.; New York, \$42.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 4.

American Pig Iron.—The pig iron market is duller than ever, and the demand seems to grow less. It is not to be denied that to-day the iron market shows more lack of animation than it has at any time this year. The reports from iron centers all over the United States would show that furnaces are going out of blast everywhere; this is, perhaps, the only encouraging feature of the market. Odd lots of Southern iron have pressed for sale during the week, but we hear of no sale of magnitude to which especial importance should be attached by reason of very low prices. The consumer does not appear to desire to buy much iron at any price. During the week the report was circulated that representatives of three leading Alabama companies had come to New York to consult with the directors of the railroads to obtain a reduction in freights, and also to see what arrangements could be made with Northern furnaces in order to ameliorate the condition of the iron market. As a matter of fact, the persons alluded to are here to settle difficulties in the coal mining departments of their respective companies, some of which have been underselling others.

From the North and West the reports of our correspondents will be found especially interesting this week. Furnaces in the Shenango and Mahoning Valleys are blowing out; from Chicago similar information is received. Certainly the only thing that could benefit the market would be a curtailment of the production.

In regard to prices but little can be said. In such times as these rumors are more numerous than the sands of the sea. In this market no very low priced sales have been made, for reasons stated before. Quotations are: Northern No. 1 X., \$16.50 @ \$17.50; No. 2 X., \$15 @ \$16; Southern No. 1 X., \$16 @ \$17; No. 2 X., \$15 @ \$16.

Spiegeleisen and Ferromanganese.—Nothing of importance is doing in the market for spiegeleisen and ferromanganese, which continues dull and featureless. Quotations are as follows: 20% spiegeleisen, \$26.50 @ \$27; 80% ferromanganese, \$62 @ \$63.

Steel Rails.—The rail market continues very quiet. During the week a sale of 4,000 tons of steel rails was made by the Lackawanna Iron & Steel Company to a Pacific Coast railway. The price was \$30 at mill. Quotations remain \$30 f. o. b. mill and \$30.75 at tidewater.

Rail Fastenings.—This market is exceedingly dull. We quote fish and angle plates, 1 75¢ @ 1 80¢; spikes, 2 10¢ @ 2 15¢; bolts and square nuts, 2 70¢ @ 2 80¢; hexagonal nuts, 2 80¢ @ 2 85¢.

Merchant Steel.—Business in this market is reported brisk. Prices are holding their own fairly well. We continue to quote: Mushet's special, 48c.; English tool, 15c. net; American tool steel, 7 @ 8c.; special grades, 13 @ 18c.; crucible machinery steel, 4 75c.; crucible spring, 3 75c.; open hearth machinery, 2 25c.; open hearth spring, 2 50c.; tire steel, 2 25c.; toe calks, 2 25 @ 2 50c.; first quality sheet, 10c.; second quality sheet, 8c.

Tubes and Pipe.—A fair business is doing in this market at unchanged prices. We quote ruling discounts as follows: Butt, black, 5 7 1/2%; butt, galvanized, 4 7%; lap, black, 6 7%; lap, galvanized, 5 5%; boiler tubes, under 3 in. and over 6 in., 5 5%; 3 in. to 6 in., 6 0%.

Structural Material.—This market continues without features of special interest. New business just now is the exception rather than the rule. Our quotations are as follows: Beams, 2 30¢ @ 2 50¢; angles, 1 90¢ @ 2 10¢; sheared plates, 1 85¢ @ 2c.; tees, 2 40¢ @ 2 60¢; channels, 2 40¢ @ 2 50¢. Universal plates, 2 10¢; bridge plates, 2 10¢ on dock.

Old Rails.—There is nothing doing in old rails. The market continues dull and featureless. No sales are reported. Nominal quotations are: Old tees, \$20 @ \$21; doubles, \$22 @ \$23. Wrought iron scrap is quoted at \$19 @ \$20.

NOTES OF THE WEEK.

The directors of the Tennessee Coal and Iron Company met on the 3d inst., but took no action on the dividend question. The company has a surplus large enough to pay a dividend, but this surplus is mostly in pig iron. Only routine business was transacted.

Chicago, March 2.

(From Our Special Correspondent.)

The month of February has been a disappointing one in nearly all branches of the iron trade, especially so after all the high hopes which had been formed in the two preceding months. Much of the prevailing quietness is attributed to the dilatory action on the part of railroads in withholding orders for supplies; but more is due to the over confidence of furnace and mill men. Production

and output of crude and manufactured iron is now such that restriction is the only remedy. The low prices offering appear to be of no avail in inducing consumers to increase orders. At least one local furnace has gone out of blast on foundry coke and a number in Ohio will blow out this week.

Pig iron is quiet, but an increased demand is looked for during March. Manufactured iron, bars, sheets, plates, etc., continue dull, and prices somewhat irregular. Structural shapes are in good inquiry, and a large amount of work is in sight. Merchant and other soft steels are moving briskly into consumers' hands. Steel rails are in fair demand, and inquiries for round lots are pending. The rolling mill mentioned last week as about to resume has decided not to do so until the market improves.

Pig Iron.—Last week showed an improved inquiry for local coke iron, and actual transactions were larger than the preceding week. Two large sales, one of 1,000 tons and another of 1,200 tons, were made, and small orders from car loads to 200 tons have been more numerous. One development of the week is the concerted action of a number of Ohio furnace men, who will blow out this week and remain out until stocks are reduced and demand improves. A wholesale cessation of furnace work would soon lead to a betterment of the business condition. The low prices now current for Northern iron practically close this market for Southern coke foundry iron; but No. 2 soft is in some demand in small lots. Lake charcoal iron is inactive, prices are weaker, and several furnaces will go out of blast as soon as present supplies of ore and fuel are used; some may not resume. The situation is becoming serious, in some respects critical and much depends upon the action taken by manufacturers as to restrictive measures.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$17@17.50; Lake Superior coke, No. 1, \$15@16; No. 2, \$14.25@14.75; No. 3, \$14@14.50; Lake Superior Bessemer, \$17; Lake Superior Scotch, \$16@17; American Scotch, \$17.75@18.25; Southern coke, foundry No. 1, \$15.50; No. 2, \$15; No. 3, \$14.50; Southern coke, soft, No. 1, \$15.50; No. 2, \$14.50; Ohio silveries, No. 1, \$18; No. 2, \$17; Tennessee charcoal, No. 1, \$18; No. 2, \$17.50; Southern standard car wheel, \$20@21.

Structural Iron and Steel.—Work will commence April 1st on the Terminal Railroad, State and 14th streets, this city. The amount of steel and iron required will be enormous. General demand is good for structural material girder and bridge work, etc. Regular quotations are: Car lots f. o. b. Chicago are as follows: Angles, \$2@2.10; tees, \$2.20@2.30; universal plates, \$2.05@2.15; sheared plates, \$2.10@2.15; beams and channels, \$2.40@2.50.

Plates.—Warehouse business has been fair through the past month, but mill orders are few and far between and prices much demoralized. Steel sheets, 10 to 14, \$2.40@2.50; iron sheets, 10 to 14, \$2.20@2.30; tank iron or steel, \$2.10@2.15; shell iron or steel, \$3@3.25; firebox steel, \$1.25@1.50; flange steel, \$2.75@3.25; boiler rivets, \$4.25; boiler tubes, 2 1/2 in. and smaller, 55%; 7 in. and upward, 65%.

Merchant Steel.—Large amounts of soft steels are being shipped on contract account. There is a good inquiry from consumers, and an evident tendency to cover all possible requirements at present low figures. Tool steel is moderately active—in best grades quite lively. We quote \$6.75@7 and upward; tire steel, \$2.30@2.50; toe calk, \$2.50@2.65; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.75@1.90; open hearth machinery, \$2.60@2.75; open hearth carriage spring, \$2.30@2.40; crucible spring, \$3.75@4.

Galvanized Sheet Iron.—There is little doing in mill lots and warehouse business is very moderate. Discounts are nunchanted at 70% off on Juniata from mill, and 67 1/2% off from warehouse, and 67 1/2 and 5% off on charcoal—new list.

Black Sheet Iron.—This is the dull season for sheet iron, and other than an occasional carload, there is no demand. Quotations are 2.85c. Chicago for No. 27 common, and 3c. from stock for iron or steel.

Bar Iron.—Demand is quiet; orders coming in are chiefly for carloads on which mills quote 1'65@1'70c., the latter for railroad car specification iron. Demand for this class of material is fair in from 100 to 200 ton lots. Warehouse business continues moderately good at 1'7@1'85c. rates according to quality.

Nails.—Wire nails in round lots are \$1.85 and \$1.90 for car loads, and demand quiet. Jobbing trade dull at \$1.95. Steel cut nails are more active and mills in this vicinity are well supplied with orders. Quotations are \$1.60 on regular specification from mill and \$1.70 in a jobbing way from store.

Steel Rails.—Several round lots are under consideration from the Northwest, and actual current demand for small quantities from 500 to several thousand tons is good. The sales of standard sections so far placed for this year's delivery are more than twice the tonnage as compared with a year ago. The outlook from this section of the country is very promising. Prices are steady at \$31.50@33. Fastenings, bolts, etc., are in fair demand. Regular quotations are: 1'80@1'85c. for

steel or iron; spikes at \$2.15@2.25 per 100 lbs., track bolts, hexagonal nuts, \$2.65@2.70.

Scrap.—Scrap is stagnant, and dealers characterize local trade as exceedingly dull. Prices are nominal. No. 1 railroad, \$18.50; No. 1 forge, \$17.50; No. 1 mill, \$13; fish plates, \$20.50; axles, \$22; horse-shoes, \$18; pipes and flues, \$11; cast borings, \$7.50; wrought turnings, \$9.50; axle turnings, \$12.50; machinery castings, \$12; stove plates, \$8.50; mixed steel, \$11.50; coil steel, \$14.50; leaf steel, \$15; tires, \$15.50.

Old Material.—Consumers apparently are well supplied with iron rails, as offerings are large and there are no bids. A nominal quotation would be \$21.50. Old steel rails are very dull at \$13.50@15.50, and old car wheels quiet at \$16@16.25.

Louisville. Feb. 27.

(Special Report by Hall Brothers & Co.)

A few more orders have been placed during the present week than the week previous, but prices have varied materially, in most cases ruling lower. Buyers seem to have had pretty much their own say, especially when dealing with two or three of the larger companies, who have exhibited signs of great anxiety for orders and apparently without regard to price or delivery. Whatever the cost of production may be the opinion prevails that some furnaces are selling at an absolute loss. The only open remedy for prices seems to be either curtailment of production or radical increase in consumption, but with no immediate prospect for either. We quote:

Hot Blast Foundry Irons.—Southern coke No. 1, \$14@14.25; Southern coke No. 2, \$13.25@13.75; Southern coke No. 3, \$13@13.25; Southern charcoal No. 1, \$16@17; Southern charcoal No. 2, \$15.50@16; Missouri charcoal No. 1, \$17@17.50; Missouri charcoal No. 2, \$16.50@17.

Forge Irons.—Neutral coke, \$12.50@12.75; cold short, \$12.25@12.50; mottled, \$11.50@12.

Car Wheel & Malleable Irons.—Southern (Standard brands), \$18@18.50; Southern (other brands), \$17@17.50; Lake Superior, \$19.50@20.50.

Philadelphia. March 3.

(From our Special Correspondent.)

Pig Iron.—The demoralized condition of the iron market continues. Several strong companies still refuse to shade quotations. The restriction of production now talked of may not be as serious as appears at present. The question of restricting is being discussed in many quarters. Several large sales of Southern irons have been made in this and near by markets, and offerings have been received to-day which indicate that makers of Southern brands are determined to push the sales of their iron as vigorously as possible. Quotations for No. 1 Southern, \$16.50; No. 2, \$15.50; Northern No. 1 foundry, \$17.50 for best and \$15.75@16 for No. 2. Sales of Bessemer were made at \$17.50 and inquiries are quite active for Bessemer and low phosphorous irons.

Muck Bars.—The average selling price appears to be \$25.50.

Steel Billets.—Several makers who two weeks ago said no effort would be made to sell, have since then done some active canvassing and made small sales on a basis of \$25.25@25.50. The market is in an unsatisfactory condition.

Merchant Iron.—Very little business is being done, excepting in a retail way, and it is impossible to gather any fresh facts. Quotations, \$1.60@1.70.

Nails.—Nails are hard to move, and continue at \$1.50@1.70, according to size of order.

Skelp Iron.—Small lots of skelp have been sold within a day or two at terms not mentioned.

Wrought Iron Pipe.—Vigorous efforts are being made in some quarters to make heavy sales for the summer, but buyers who will have need of pipe then are not inclined to rush into market now.

Sheet Iron.—Store sales are quite active for small lots of best refined. Early summer deliveries of galvanized are being inquired after, and manufacturers are disposed to make every possible concession.

Plate and Tank Iron.—Assurances are given to-day that a very large amount of business is likely to be placed soon, but there is nothing on the horizon to justify the expectations of large sales beyond these assurances. It has been known for some weeks past that a large amount of plate will be wanted some time in the early spring, but whether there are stronger probabilities to-day for these heavy sales it is impossible to say.

Structural Material.—About the same remarks apply to structural material. Two or three mills are crowded, while the rest are running along in a zigzag way. There is a great deal of material wanted, but the requirements are not at all urgent, and those who are authority upon this point prefer to not say anything more. Angles, \$1.85; beams, \$2.25@2.40.

Steel Rails.—There is some stir in the steel rail trade, presumably due to the receiving of inquiries for summer delivery. There is not much to be said as yet, and inquiries are all answered the same way; that is, prices are firm, and there will not be any departure from the figures so long quoted, namely, \$30. A heavier demand is to come from the South and West, but then the next

question arises, how much of this business will float east of the mountains.

Old Rails.—Quotations are \$20.50@21.

Scrap.—Railroad scrap is wanted at about \$19, but two or three parties who have a few lots on hand ask \$20@20.50.

Pittsburg. March 3.

(From our Special Correspondent.)

The iron trade continues in a demoralized condition. The outlook at present is by no means a favorable one. Prices for all descriptions of iron and steel are weak and unsatisfactory. We are now in the third month of the year; the improvement so long expected has not yet put in an appearance. So far as prices are concerned, there has been no further decline; there has been a moderate demand for Bessemer pig at the low prices that govern the market at present. Throughout the producing centers of the country the same inactivity that has prevailed for some time past continues.

Competition for business has been active and prices, in some instances, have been lowered to secure contracts. Consumers, as a general thing, are only placing orders for iron as they need it. Although consumption continues large, the output of the furnaces remains of heavy proportions and there has undoubtedly been some increase in the amount of unsold stock since the beginning of the year. It is the prevailing opinion that there can be no pronounced improvement in trade until the furnace companies shall recognize that there is an overproduction and take steps to restrict the output.

In regard to values the present seems to be the dark hour before the dawn. Prices have undoubtedly been the lowest for years, and in some directions the lowest ever recorded; prices are unquestionably considerable of a mystery these days. While certain brands have a clearly defined position, there are other irons claiming to be equal in quality, equal in grading, and in all respects fully up to the standard that have been shaded before sales could be consummated. A large number of furnaces are being banked or blown out. Those who have piled up large amounts are getting ready to unload them at some price. City furnace irons have such an excellent reputation that top prices are always obtained for Bessemer, grey forge and foundries.

During the week there has been quite a controversy in regard to iron and steel products. There seems to be a difference of opinion caused by a dull market and the discharge of so many puddlers at various establishments. A leading iron man says about the situation: "It may be sized up by the one word—overproduction. It has been charged that these several shut downs mean a combination of the firms against the workmen, but there is not a word of truth in that. We are simply overstocked and must give our puddling furnace a good rest before we can resume on legitimate business lines and at a profit. Iron has of late been much crowded out by soft Bessemer steel; the steel we can use, but not the iron. We can sell the steel for exactly the same price as iron. It is altogether probable that we will never start up these furnaces again." Another iron man defends iron. He says: "The iron business will recover, but steel is crowding it very closely. I am not of the opinion that it is going to be knocked out completely because of the advantage that exists in the manufacture and uses of steel, and its supreme adaptability to so many purposes formerly filled by iron."

Coke Smelted Lake and Native Ores.

5,000 Tons Bessemer, next three mos.	\$15.00 cash.
5,000 Tons Bessemer, March, April, May	14.75 cash.
5,000 Tons Bessemer	14.75 cash.
1,000 Tons Bessemer	14.75 cash.
1,000 Tons Grey Forge	13.10 cash.
500 Tons Grey Forge	13.25 cash.
500 Tons Grey Forge	13.00 cash.
500 Tons Mill Iron, Extra	13.75 cash.
500 Tons Grey Forge at Valley Furnace	12.50 cash.
500 Tons Bessemer, City Furnace	15.00 cash.
400 Tons No. 2 Foundry	14.25 cash.
200 Tons No. 3 Foundry	14.00 cash.
200 Tons Mill Iron	13.25 cash.
100 Tons No. 1 Foundry	15.50 cash.

Charcoal.

100 Tons No. 1 Foundry	21.00 cash.
100 Tons No. 2 Foundry	20.00 cash.
100 Tons Warm Blast	18.50 cash.
100 Tons Cold Blast	26.50 cash.
50 Tons No. 1 Foundry	21.00 cash.

Steel Slabs and Billets.

2,500 Tons Steel Billets, April, May	23.00 cash.
1,000 Tons Steel Billets, April, May	23.25 cash.
1,000 Tons Steel Billets, April, May	23.20 cash.
1,000 Tons Steel Billets, March, April	23.25 cash.

Muck Bar.

2,000 Tons Neutral, March	25.50 cash.
500 Tons Neutral, April, May	25.35 cash.

Ferro-Manganese.

100 Tons 80% domestic	63.00 cash.
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Skelp Iron.

2,100 Tons Sheared Iron	1.85 4m.
300 Tons Narrow Grooved	1.57 1/2 4m.
300 Tons Wide Grooved	1.60 4m.

Steel Wire Rods.

550 Tons American Fives, April, at Mill	32.50 cash.
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Bloom and Beam Ends.

1,200 Tons Bloom and Beam Ends	17.00 cash.
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Old Iron and Steel Rails.

500 Tons Old Steel Rails	17.00 cash.
500 Tons Old Iron Rails	22.25 cash.

Scrap Material.

100 Tons No. 1 R. R. W. Scrap, net	19.50 cash.
100 Tons Leaf Steel, gross	20.50 cash.
100 Tons Cut W. Pipe, net	16.00 cash.

NEW YORK MINING STOCKS QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, including columns for Name and Location of Company, dates from Feb. 27 to March 4, and Sales. Includes sub-sections for Dividend-paying and Non-dividend-paying mines.

Ex-dividend. + Dealt in the New York Stock Ex. Unlisted securities. † Assessment paid. ‡ Assessment unpaid. Dividend shares sold, 8,745. Non-dividend shares sold, 19,900. Total shares sold, 28,645.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names, dates from Feb. 26 to Mar. 3, and sales figures.

Dividend shares sold, 11,571. Non-dividend shares sold, 6,995. Total shares sold, 18,566.

COAL STOCKS.

Table of Coal Stocks, listing company names, dates from Feb. 27 to Mar. 4, and sales figures.

Total shares sold, 747,642.

San Francisco Mining Stock Quotations.

Table of San Francisco Mining Stock Quotations, listing company names and closing quotations from Feb. 26 to Mar. 3.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES (No., Par), ASSESSMENTS (Total levied, Date and amount of last), DIVIDENDS (Total paid, Date and amount of last), and NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES (No., Par), ASSESSMENTS (Total levied, Date and amount of last).

G. Gold, S. Silver, L. Lead, C. Copper. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The dead wood previously paid \$275,000 in eleven dividends. ¶ Terra \$75,000. Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Con. Virginia \$1,000,000 in 1880.

