

THE ENGINEERING AND MINING JOURNAL



Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XLV. JUNE 30. No. 26.

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THE SCIENTIFIC PUBLISHING CO., Publishers.

P.O. Box 1833. 27 Park Place, New York.

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the mineral resources of the country, to improve the condition of our people, and to extend the markets for American products in foreign lands. These aims are independent of politics, and are not affected by the name of the party in power. We feel assured that whichever party wins in the coming election the progress of the country will go on, and none of the dire events predicted by each side should the other succeed will come to pass.

For the time being, many timid people may feel nervous about the future, some may even believe the country will go to the eternal bow-wows if the party opposed to them gets in power, and the temporary depression in business, which always accompanies a presidential election, must be expected. There are, however, no grounds for any real anxiety, much less for any commercial crisis, and the anticipation of the result of the election certainly does not create any of the serious and genuine alarm that was felt four years ago by many who feared the effects of a change.

When the politicians get through talking, business will be found to have been satisfactory throughout the country, and every one will then feel confidence, and help to inspire and justify it in the marvelous resources and unrivaled progress of our beloved country.

RAILROADS TO DEVELOP THE MINERAL RESOURCES OF SOUTH AMERICA,

Reports are once more afloat regarding a great South American continental railroad to be built from Buenos Ayres through Paraguay, Bolivia, Peru, and Ecuador to Bogota, and thence to the coast. Even if there were any assurance that this undertaking were to be carried out, we would suggest that the promoters forego some of their all-embracing generosity and not wander out of the way to acquaint the Paraguenos with the music of the locomotive whistle; but the truth is that this great South American trunk line exists still as a mere conception, which has not yet descended in any visible shape from the upper airs.

At present there is not a single mile of railroad in Bolivia, but a line from Buenos Ayres is approaching from the south, having progressed as far as Salta, and will pass through Quiaca and Potosi to Sucre, opening up a region once the most famous in the world for its silver mines, and whose riches are still unexhausted. The Brazilians are coming in from the northeast with a road starting at San Antonio, the head of navigation on the Madeira River. The first Bolivian terminus of this road will be Santa Cruz. Afterward it will continue to Sucre. A third railroad is being built by the Chilean government from Antofagasta, a port on the Pacific, to Huanchaca, in Bolivia, a distance of 280 miles. The primary object of this enterprise is to open up the silver deposits in that portion of the Andes; but, for the sake of the concession to enter Bolivian territory, the Chilean government agreed to extend the line to Sucre.

The governments of Colombia and Ecuador have not begun to dream of railroad connections with the southern republics. There is nothing to encourage it, for their interests lie in the United States and Europe. What they most desire is an outlet to the coast. Ecuador has two lines in process of building—one from Guayaquil to Quito, which is in operation for a distance of sixty-five miles from the coast, and another from

ADVICES from Paris indicate that the Panama lottery loan has proved a partial failure, not more than two thirds of it having been taken. It is further stated that a syndicate has agreed to lend to the Panama Canal Company, on condition that unsold bonds amounting to 30,000,000 francs be deposited as security an immediate advance of one sixth of the nominal value, the bonds to be sold at the convenience of the syndicate, and the proceeds to be handed to the company, less the advance, the interest, and a commission of 7 1/2 francs per bond. These bonds therefore are held by bankers to be worth only one sixth their face value. By engineers they are held to be worth nothing.

Few of the confiding people who have sunk such enormous amounts in this fathomless pit are heeding the warnings given by l'Economiste Francaise, and even the wisdom of these has come too late to save the millions already invested in the worst, if not most dishonestly managed engineering enterprise of the present century.

THE ENGINEERING AND MINING JOURNAL takes no part in politics. Its mission is to promote the economical and profitable development of

Bahia to Quito, which has been opened up also a portion of the way. A charter has also been granted to FREDERICK WESSON, of New York, for a third line from San Lorenzo Bay to Ibarra. With each of these charters the government has given a guarantee of 6 per cent on the capital invested.

Colombia has granted a charter to a French company, with a guarantee of 7 per cent, to build a road from Buenaventura, on the Pacific, to Cali, for the purpose of reaching extensive coal-fields in that region. In the Cordillera Occidental, which the railroad will cross, gold and other minerals are said to exist abundantly. The road in which Colombia is most interested at present is a short line through the mountains to connect the capital, Bogota, with Jirardot, the head of navigation on the Magdalena River. This will give them easy communication with the outer world, which they have never had, all supplies heretofore coming sixty-five miles on mule-back.

The needs of commerce will cause the building of South American roads soon enough, but even Mr. HELPER, after years of assiduous lobbying and book-writing on the subject, has not convinced the world or a single government, that the time is ripe for an enterprise of such weary length as the South American Continental Railroad.

The development of the South American States by the opening of these several new avenues for commerce has an especial interest for American manufacturers and engineers. Each of the roads relies largely for business upon the mineral resources of the district through which it is to pass and throughout South America our American locomotives, cars and other railroad appliances are greatly preferred to the European articles, while the development of the vast and rich mineral fields of the Andes will call for many American civil and mining engineers and metallurgists, and for many mills and furnaces for treating the ores. The skill and experience in metallurgy and mining acquired in this country have given rise to a demand for American practice and managers from every part of the world, and the opening up of this great Andean field should prove of the utmost importance to our merchants and manufacturers, as well as to the engineering profession.

THE CHALK AGE OF MECHANICAL ENGINEERING.

This is the felicitous title of an address delivered before the Section of Mechanical Engineering at Sibley College by Mr. J. F. HOLLOWAY, formerly of Cleveland, O., and now of this city. The address itself is no less happy than its title.

Quoting somebody's characterization of the present as the "Blue-print" age in mechanical engineering, Mr. HOLLOWAY suggests "the Chalk age" as the designation of the preceding period, when the perfect fitting of parts according to scale-drawings and with the help of machine-tools, was an art almost unknown.

He sketches with an accuracy of detail that betrays familiar knowledge, and approaches autobiography, the career of a boy of the last generation, bent on becoming a mechanical engineer. He begins with whittling a pine wind-mill for the top of a barn; he builds a miniature water-wheel to run a miniature pump; then he files and chips castings in the village foundry, is promoted to be a molder, and at last, by gradual steps, a blacksmith.

"The drawings furnished the smith in those days were of varied styles. Sometimes the object wanted was somewhat crudely drawn in the dirt floor of the shop, by the toe of the master's boot. If it was something very particular, it was chalked out on the back of the door, or on the top of the bellows, accompanied with a verbal description, aided by a thick thumb sliding up and down a well worn rule."

The next stage of education was the machine-shop, "in which," as Mr. HOLLOWAY well says, "the boys of long ago worked, and, unaided, wrestled with difficult problems, and from out of which there came some of the ablest thinkers, as well as the most successful engineers, of to-day." We extract a paragraph or two from his vivid description of the machine-shop of "the Chalk age:"

"I can, perhaps, convey some idea of what the old time machine-shop had, by naming some of the many things it did not have. While it did have, as you will infer, a foundry at one end and a smith-shop at the other, and between them little less than smoke and grit, fortunately the latter got so well ground into the apprentice boys of those days that it stuck to them all their lives, and served to help them out of many a difficulty.

"There were no planers there, no slotters or shapers, no boring mills; and all we boys knew of their existence were tales told us by bibulous tramp machinists, who, wandering out into the then far West, filled us with wonder as we sat about the stove at night and listened to the tales they told of the big tools they had worked on at Matty Baldwin's, in the Allaire, the Secor, or Novelty Works, or at West Point. But not alone were all these wanting in the old time shop, but as well were twist drills, except of the home-made pattern, screw cutting machines, relieved taps, etc., while jigs, standard gauges, and reamers were either among the things not yet dreamed of, or among those only hinted as being possible in the far off machine shops of the millennium.

"There was there, to be sure, the wabbling grindstone in the corner, above which hung the white-lead keg, emptied of its paint, but filled with water which dripped on the revolving stone, graduated as to the quantity escaping by a loosely fitted pine plug in the bottom. In the center of the shop stood the cannon stove, about which was heaped up fortifications of ashes, coal dust, and shop litter, and around which the cub machinist, petticoat lamp in hand, skirmished at night, stumbling, and barking his shins against the broken horse power machines and corn shellers that lay in ambush for him in the darkness. * * *

"I am sure that no graduate of Sibley College will ever have any experience in

cutting bolts and tapping nuts with the appliances of this gone-by age. As I before said, there were no bolt-cutting and nut-tapping machines in the old time shops of which I speak, and I never look upon one of these elegant and polished thread-cutting machines, in which the severest labor of the attendant consists in lifting the bolt up on the machine, and gently turning a lever to clamp it in its jaws, and then push it forward until it comes in contact with the well-shaped dies, which, under a stream of self-pumped oil, cut on it a clean, smooth, and uniform sized thread, and which when finished is dropped into the sawdust bath below, but that I am reminded of the well-named "jam plate" of my youth, and the flat-sided taper taps that kept it company.

"The rule of the smith was to swage down the end of the bolt until it would enter the nut, and the barbarous screw jamming tools, aided by the strained muscles and the sweating brows of the apprentice boys, bruised and raised up a thread outside the bolt, and inside the nut, so they would fit together. So uneven were their sizes, that each bolt and nut were fitted to each other, and when taking down a machine, woe betide the fellow who got them mixed!"

The rude appliances and methods thus graphically described had one good quality which is hard to find in the specialized mechanical arts of to-day. They bred versatile, ingenious and inventive workmen; and the place of such training "all round" as they afforded must be filled hereafter by thorough practical preliminary instruction, or it is likely to go empty.

Beyond all question, the multiplication of machine-tools, with its result in the interchangeability of parts in all machines, from a watch to a locomotive, is the most important social and industrial force of modern times. For it is not machinery merely, but cheap machinery, that has revolutionized all arts and trades. The change has been a constantly accelerating one. It has produced incomparably its greatest results within the past two decades. That it has already bestowed upon society inestimable benefits, is admitted by all who can appreciate statistics. The world, hitherto poor on the whole, and producing little more than it consumed, is beginning to grow rich.

We hear sometimes that labor receives a smaller percentage than formerly of the wealth which it creates. This is one of the burdens of Mr. HENRY GEORGE'S complaint. No statement could be more sophistical. The "percentage" is no measure of the laborer's reward. In the good old days, a man could dig iron-ore, burn charcoal, make iron in a forge, hammer it into a bar, make a horseshoe out of the bar, and, if lucky enough to get a customer, sell the horseshoe, receiving nearly 100 per cent of the price as the wages of his own labor. Science and capital propose to take him and a hundred like him into partnership, and to make with the same labor a hundred horseshoes instead of one. The man receives more money for his work than before, and the money buys more goods than before—a similar cheapening of other manufactures having been effected at the same time. But he complains instead of getting 100 per cent he only gets 50 or 40 per cent of "the wealth he creates"! The real question is, Does the smaller percentage bring him a larger reward? To this question there has been for twenty years past but one answer. The wages of labor have been increased whether measured in money or in their purchasing capacity; and the profits of capital have steadily decreased, while large amounts of capital invested in ships, buildings and machines have been practically destroyed before their natural time of decay by the progressive improvement of every trade and art, and the reconstruction of commercial relations by railroads and telegraphs. Yet even capital can afford, on the whole, these losses. Individuals and companies are ruined; but the community grows rapidly richer.

This stupendous revolution is involved in one sentence: The age of Chalk has passed away, and the age of Blue-prints has come. It is a blessing in every view but one—its possible effect on the individual man, in making him cease to be individual. Let us have multiplied designs and interchangeable parts for everything except manhood. A man ought not to be an interchangeable 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 will not hold ourselves responsible for the opinions expressed by correspondents.

The Long Mexican Tunnel.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Notwithstanding the ingenuity of your explanation of the statement of the length of the tunnel to drain the valley of Mexico, you are wrong. The JOURNAL was correct, of course, in saying "miles, for miles it is," but your "Printer's D., or some other D.," made the slight mistake of misplacing a decimal point: instead of the tunnel being 9520 miles long, it is 9.520 miles, or a little more than nine and a half miles, and of this about one mile (1/1000) is completed. After all, so much "British gold" can get into any little hole in the ground, if it were 9520 miles it would surely bankrupt Great Britain, and then what would we do with our worthless mines? It is bad enough as it is, so I beg you will replace the missing decimal and save us some part at least of the London market. What a fuss to make over so small a matter as the position of a point! I am quite out of patience with you. AMICO.

The Losses in Concentrating Magnetites by the Conkling Jig.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Having been engaged for fifteen years in designing and manufacturing concentrating machinery, we have followed with considerable interest the development, from the crude methods of the past, of a system

for the more efficient separation of iron from its ores. The infant beginnings of this comparatively new industry, together with a series of very interesting experiments, have been briefly recorded in your paper by Messrs. Maynard & Kunhardt of this city. From these and other tests lately made with electrical separators, the fact seems to be well established that phosphorus can be largely eliminated from many ores by concentration. We fear, however, that in all these operations, the quantity of the product has been sacrificed to the quality. This opinion is strengthened by the statement of Messrs. Maynard & Kunhardt, that "only one company in the East—that of Chateaugay—is regularly shipping separated ore to Bessemer furnaces in large quantities, but its signal success with very lean ores is certain to stimulate the owners of other deposits, more especially as the field is broad enough to accommodate many workers without crowding." The signal success referred to is explained by them in detail to mean that a 35 per cent ore is converted into a 65.5 per cent concentrate, with a loss of from 18 per cent to 22 per cent in the tailings.

If we look closely into this statement of facts, coupled with another, that from 3 to 3½ tons of 35 per cent crude ore are required to produce one ton of concentrates carrying 65.5 per cent iron, we find that out of from 105 to 114.75 units of iron in the original stock, they save 65.5, and lose from 39.5 to 49.25 units. This, figured in percentages shows a saving of about 60 per cent. As there is probably not another iron ore body in the United States which could be made to pay if similarly treated, we think it of the utmost importance before other mills are erected after like designs, to carefully study the causes which lead up to these losses, and avoid them, as far as possible, in future plants.

1st. There is no classification of the ore before jigging. No satisfactory results need be looked for in treating the product from crushers unsized.

2d. There is no independent power for operating the jigs. The slightest changes of speed, due to the constantly varying load on the engine which drives the crusher, affects the result. An independent engine for jigs is the only remedy for this defect.

3d. The tailings show numerous "mixed grains," which need to be further reduced before the mineral can be separated.

The JOURNAL has already called the attention of the public to some of these matters, and we hope to see shortly, in its columns, an earnest discussion provoked, on a friendly basis, which may bring to light, in such a manner as that they can readily be introduced, all the economies necessary to establish this new industry upon a largely profitable and permanent footing.

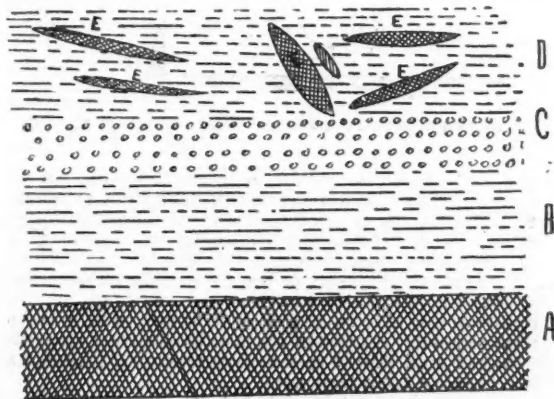
NEW YORK, June 26.

F. H. McDOWELL.

The Formation of Coal Beds

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The recent correspondence between Mr. Gresley and Mr. Nathurst upon the formation of coal seams has led me to observe more closely than I otherwise would have done the formation of the coal mines in this locality. My inexperience and incompetency will prevent me saying any thing for or against the theories held by those gentlemen, and my only object in writing is to submit the following sketch of a formation of coal that I have lately observed. The sketch represents a section (5 feet horizontal by 4 feet vertical) of the main coal seam and the overlying sandstone. The main seam is repre-



Formation of Coal Seams.

sented at A. The fine grained stone at B D. At C is layer of pudding stone, but having no sharp line of demarkation from the fine-grained sandstone above and below. Now, about two feet above the main seam, and in no wise connected with it, and in the fine grained sandstone, are amygdaloidal detachments of coal, and it is the formation of them I should like to hear explained.

The horizontal lines of deposition of the sandstone are not displaced, but only their continuity is broken by them.

Their formation, in my opinion, can not be explained by the growth in situ theory, nor by the peat like growth theory.

It is my hope that the above will attract the attention of geologists, and that this will be regarded as worthy of a few remarks from them.

Yours truly,

D. LEE WARDROPER.

KELLEY'S FERRY FURNACE, Ga., June, 1887.

Various Notes from London.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: At the recent meetings of the Geological, the Royal, and the Chemical societies, matters were presented and discussed which may be generally, if not specially, interesting to your readers.

EAST INDIAN GOLD ROCKS.

At the Geological Society, Mr. Attwood gave an account of the gold-bearing rocks of the Mysore Province, India, and of the primitive, and

perhaps prehistoric, methods of pounding out the gold from the quartz in mortars excavated in the solid rocks. The specimens of rock formations consisted chiefly of mica slates, quartzites, and porphyries, clearly of Archaean age, and closely resembling the auriferous rocks of Deadwood, Dakota.

SALT DEPOSITS OF DURHAM.

A description of the salt deposits of the north of England showed that a considerable area along the Tees Valley, bordering the carboniferous limestone, is underlaid by beds of pure rock salt nearly one hundred feet thick. Numerous borings to a depth, generally, of about 1300 feet, have passed through the Trias, and found the salt resting upon the subjacent limestone beds, which contain gypsum and anhydrite. In places, however, the salt is wanting or has thinned down to such an extent as to make it evident that it lies in basin-shaped depressions. The Messrs. Bell, at Middlesbrough, have tubed some of the wells, and pumped up the brine obtained by sending down a stream of water, but in a short time the outflow is checked and even stopped by the accumulation of solid impurities around the pipe.

BURMAH RUBIES

The Indian Government has sent to the society a present of a suite of specimens of rubies in the gangue. These were exhibited to the members, and it is easy to see why they are generally found detached and separated from their original matrix, for this matrix is a coarsely crystallized white limestone, easily dissolved and disintegrated, and is much like the white limestone of Sussex County, New Jersey, in which, also, both blue and red sapphires occur.

WELSH GOLD.

Considerable interest is revived in the gold veins of Wales. Active prospecting has been going on, and the gold region has had very effective free advertising in consequence of the government's action in claiming all the precious metals, or an uncertain percentage, pending the determination of which the crown officials objected to the gold being carried away. In the course of time, however, it is believed that the strong common sense of John Bull will avail of the experience of the world elsewhere, and conclude to make the development of the veins and deposits as free as it ought to be. The interest of the public in this direction has been greatly stimulated by Mr. Pritchard Morgan's exhibition at the Royal Society's soiree of a case of specimens of quartz containing a very large amount of free gold and an immense ingot of gold representing the amount extracted from his mines. It is stated that between October 14th, 1887, and May 28th, 1888, 1333 tons of quartz were crushed at Mount Morgan, Wales, and yielded "an average of over three ounces of gold to the ton," and that during the past fortnight there has been a "repeated average" of eight ounces to the ton. The word "repeated" suggests the inquiry How often was the "average" determined? There is a desire to extend the area of such promising gold deposits, and the last announcement is that distinct gold-bearing veins have been found in the dangerous Platter's Rocks, sixteen acres in extent, off Holyhead Harbor, which the local Board of Trade is most anxious to have removed, and the suggestion is adroitly made that the discovery of gold in them may assist the government to conclude to spend £250,000 in mining them out of the way.

DIAMOND MINES.

Few persons in America realize to what an extent the production of diamonds has been carried in South Africa of late years. It is here brought more vividly to one's attention by the great number of stock companies organized to work the deposits and to distribute dividends, whose shares are quoted daily, and in which thousands of investors in all stations of life are interested. There has been such a continued large production of the gems from the blue clay, which seems unlimited in depth, that there has been a decided depreciation in the market value, and it became necessary for the principal companies to combine to restrict and control the production. Such a combination has recently been effected, and may be said to give a sparkling example of the tendency of the time towards controlling syndicates for all commodities the price of which is lowered by over production. The export of diamonds from Kimberly last year amounted to 3 596,036 carats of the declared value of £4,257,837 14s. 6d., giving an average of 23 shillings 7½ pence per carat. The exports during the month of April last were 402,430½ carats, valued at £400,606, showing that the production is maintained at the rate of over \$24,000,000 in value per annum.

These diamonds are not all from one district. Stones to the value of over £300,000 were received at Kimberly last year from the Orange Free State, and from river beds. They have been discovered in the Hopetown district and near Phillipstown, and the end is not yet. The descriptions given of the tenacious blue clay holding the diamonds lead me to suspect that it is the result of abrasion by movement along a line of faulting, or between strata, something like the thick selvages of the Comstock and other great lodes. Some of the diamonds are broken up.

LONDON, June 15, 1888.

WM. P. BLAKE.

The Great Lake Ore-Carrying Vessels.—The Cleveland Plaindealer gives this account of great work done by a couple of the large steel propellers lying between Escanaba and lower lake ports: The big steel ore-carriers "Cambria" and "Corsica," of the Mutual Transportation Company, have discounted all of their previous running records, and the greatest job of unloading ever performed on the lakes was finished here to-day. The "Corsica" arrived at the P. & E. docks this morning, drawing 16 feet of water under 2620 gross tons of ore. She was relieved of her immense cargo in nine hours and a half. The trip to Escanaba and return, the boat going up light, was made in four days and a half. At Bar Point, on her way down, the "Corsica" sighted the propeller "Albany," 3 miles in the lead. At Point au Pelee she passed the "Albany," gaining 3 miles in a run of about 40 miles. The propeller "Cambria's" latest trip is also a wonderful one. She left Ashtabula at 4.15 A.M. on Wednesday, May 30th, went to Erie and loaded 2156 tons of coal at W. L. Scott & Co.'s docks for the Northwestern Fuel Company, at Milwaukee. The "Cambria" reached Milwaukee on June 2, at 4 P.M. At Escanaba the "Cambria" loaded 2369 gross tons of ore and reached Ashtabula at midnight, June 6th.

CONTINUOUS STEAM HEATING ON RAILROADS.

Very interesting statistics on the result of continuous steam heating as applied on railroads were collected by a committee of the Master Car-Builders' Association, and the results, given at its recent meeting and published in *The Railroad Gazette* June 22d, have been in the main satisfactory. Disappointment is expressed by a number of roads in regard to the methods now in use for disposing of the water of condensation, and while some form of trap is generally employed, their condemnation is very pronounced. A serious difficulty evidently encountered on all sides is the leakage and subsequent freezing at the couplings. The packing used at these joints is in most cases of rubber, although "vulcabeston" receives a very favorable report from a number of roads. Metallic couplings have been tried, but some flexible form receives the preference, and the Boston & Albany Railroad, having used metallic coupling, proposes abandoning it for a flexible coupling. It was pointed out that important advantages were secured by placing the steam pipes overhead inside the cars. The condensation would thus be less than in the present system of running them under the floors, and the course of condensation being downward would promote a freer circulation throughout the train. This method is being adopted by the Chicago, Milwaukee, and St. Paul, on the strength of good results obtained by it abroad.

Some roads entertain fears that the pressure of steam is too high, and might cause serious danger in case of accident. The pressure required varies from five pounds to twenty, and with a few systems goes as high as thirty and forty. The best results seemed to be obtained with from fifteen to twenty-five pounds, when the outside temperature is as low as 20 degrees.

The time required to raise the temperature in the cars to 70 degrees during such weather is generally reported to be from one to two hours, but with the Martin Anti-fire Car Heater, on five different roads, the average length of time required was thirty minutes, with a pressure never exceeding twenty-five pounds. The Northwestern Car Heater made a similar record with a maximum pressure of ten pounds on the Northern Pacific, and with the same pressure the Wisconsin Central announces the time at from twelve to fifteen minutes. It is worthy of note that in this instance the main pipes were inside the cars. The Northern Pacific did not, with a similar arrangement, reach quite such satisfactory results, although the difference is not great. Heat was taken in all cases from the locomotive, and in nearly every instance steam alone was used, the heating in the cars being by direct radiation.

Reserve is shown by many roads in commending continuous steam heating, but analysis of the statistics shows that the difficulties have been in minor points, while the principle itself is established as correct, needing only more perfect appliances in certain details, as in the management of the water of condensation, coupling joints, and some means of retaining a comfortable temperature while the supply of steam is temporarily cut off, to make the system entirely satisfactory.

THE DESILVERIZATION OF SPEISS AT THE EUREKA CONSOLIDATED WORKS, EUREKA, NEV.

Written for the Engineering and Mining Journal by Thomas Rickard, B.S.

Among the difficulties with which the metallurgist is confronted in smelting the ores of Eureka District is the formation of an argentiferous speiss, which until recently has been rejected for want of an economical method of desilverization.

Since smelting operations were instituted in Eureka, some hundred thousand tons of speiss have accumulated, representing, roughly, \$1,500,000. It was, therefore a matter of great importance, not only that further losses in this manner be prevented, but that a feasible method be devised, whereby this vast accumulation might be converted into capital. The attempts in this direction have been numerous; most of them, however, have been, to a greater or less extent, failures. We will omit the consideration of these, though many of them, as experiments are replete with interest, and pass to a brief outline of the first practical process employed—that in use at the Richmond Works.

This consists in tapping the molten speiss into pots, the interior of which is coated with rhyolite and lime, and adding, at the same time, sufficient granulated lead or litharge to effect the maximum possible desilverization. The best results have been obtained by the use of about 25 per cent lead. The CO₂ set free from the lime by heat serves to agitate the mass, and bring the lead into contact with the precious metals. The result of this process, at its best, shows an extraction of 67 per cent of the silver and gold contents.

In 1885 a patent was granted to St. George Bryan for a process of speiss desilverization, which, though its practicability has never been tested, may lay claim to many good theoretical ideas. The patentee makes use of an air-blast, not, however, for producing agitation or ebullition in the molten mass, but to "blow out that which mineralizes," viz., the arsenic, which he considers the chief source of difficulty in reduction. The faulty points of both these processes will be noted hereafter in comparison with the process to be considered.

The analysis and assay of the speiss resulting from the treatment of the ores of Ruby Hill are as follows:

	Per cent.		Per cent.
As.....	32.95	CaO	34
Sb	13	SiO	23
Mb	2.31	Ag and Au	0.29
S	3.34		
Pb	2.18		99.659
Cu	1.06		Oz. per ton.
Fe	57.02	Ag.....	8.01
Zn	07	Au.....	43

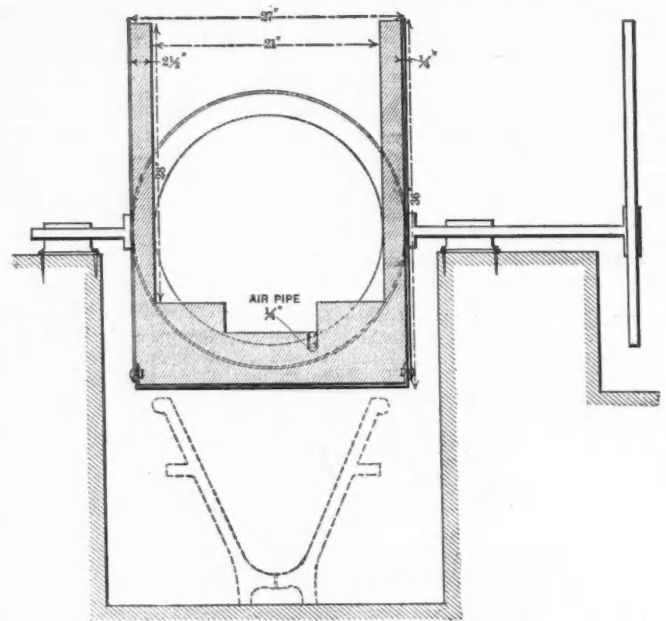
At the Eureka Consolidated Works the speiss is intermixed with the slag, entailing much labor in sorting. (At the Richmond Co.'s dump, on the other hand, it has been kept separate from the slag.) The speiss, as extracted from the dump, is charged to the ordinary lead blast furnaces of the Raschette type, in thirty to forty-pound lumps, in addition

to the ore charge, the proportions of ore and speiss being about equal by weight. The molten speiss issuing from the furnace is conducted through an iron channel attached to the spout to the converter. This speiss differs in composition and assay value from that fed, because of its concentration by the use of silicious ores, the iron of the speiss acting as a basic flux. For one month 886 tons of speiss were fed to the furnace, and 606 tons produced—a concentration of more than 30 per cent. The latter contained \$6911.31 gold and 6925.65 ounces silver, or an average value of \$11.40 gold and 11.43 ounces silver per ton.

The process now to be described is the invention of Mr. L. W. Davies, the foreman in charge of the works. Briefly stated, it consists in adding about 25 per cent of molten lead to the molten speiss in a converter under 17 pounds air pressure.

The converter is a cylinder constructed from ½-inch sheet iron, lined with fire-brick 2½ inches thick. The principal dimensions are given in the accompanying sketch:

The air is injected through a ½-inch pipe, as seen in the sketch, and a little lead is added previous to the tapping of the speiss. Eight hundred pounds of speiss—the capacity of the pots—is then run into the converter, and from 20 to 25 per cent molten lead added. The introduction of the air blast causes great agitation and bubbling in the molten mass. Dense fumes of As₂O₃ are expelled, and the bluish flame of burning arsenic, together with the fiery metal of the bath, give the scene a very weird appearance. The speiss corrodes the fire-brick lining, forming a shell of basic slag, which itself is a protection to the lining, for it adheres to it very firmly for some time. The weakest point of the converter is that part of the edge over which the speiss flows into the pots. One converter may be used for upwards of 1000 charges without relining.



Rickard's Converter for Desilverizing Speiss.

The value of the resulting bullion serves as the gauge for the amount of lead needed. Other conditions being favorable, it has been proved that when the lead, after treatment, assays about 40 ounces per ton, the results are very good. If it is of higher value it is brought down by the addition of more lead. The reason of this is that after a certain point is reached, the mechanical affinity of lead for gold and silver is taxed and losses are incurred. Similarly less lead is used if the resulting bullion falls below 40 ounces, care being taken, however, to keep the percentage of extraction as good. A crust of black oxide of iron two or three inches thick is always found on the speiss after treatment, the arsenic having been mostly expelled from that part.

Experiments have been made with hot air, but the results have not shown a sufficient improvement upon those obtained by the use of a cold blast to justify the cost involved. The whole operation occupying such a short time, there is little opportunity for chilling; on the contrary the cold air furnishes oxygen for the promotion of combustion, thereby increasing the temperature.

The time consumed in the operation is chiefly dependent upon the condition of the molten mass. If it be thick and pasty, a longer time is required than if it runs easily, for it must allow of a thorough intermixture with, and an easy gravitation of the lead. Under normal conditions it requires but from two to three minutes for the maximum results obtained.

The pot which receives the charge from the converter is constructed on the plan of the commonly used slag-pot, but heavier, on account of the greater duty imposed upon it. The interior is smeared with sand or rhyolite, which is sufficiently refractory to protect the pot from the corrosive action of the molten mass during the time of exposure.

At the bottom is a half-inch hole for tapping the lead. After reaching the pot the speiss chills very quickly, but not before the lead has gravitated to the bottom, carrying with it the silver and gold. The lead is preserved in a molten condition by the heat still retained in the speiss, and when the latter has solidified the lead is tapped into moulds, and afterwards desilverized by the Parkes zinc process.

The speiss is dumped and the pots are again smeared with sand, the heat retained by the pot sufficing to dry it. The results vary with the degree of efficiency with which the work is carried on, but, unlike any other process, are tolerably constant.

The following figures will bear direct testimony of the efficiency of

the process. They show the results of one month's work from two converters:

760 tons of speiss charged in the Raschette furnace, produced 570 tons containing	7053.05 ozs. silver.	\$10,241.88 gold.
The lead button obtained by the process contained	5889.03 " "	9,144.06 "
Loss	1164.02 " "	1,097.82 "
Percentages of extraction: silver, 83.50; gold, 89.28.		

The loss of lead in the operation is small, varying from 5 to 8 per cent. A number of interesting facts may be noted in connection with the reduction by this process. The speiss is fed in large lumps, making it most practical to use coke as a fuel on account of the coarseness of the charge. This is a direct saving in Eureka, the cost of smelting with charcoal being greater than with coke. Again, in this connection, the arsenic in the course of reduction burns to As_2O_3 , producing heat, and thus acting as a saver of fuel.

Being basic in its nature, the speiss facilitates the reduction of silicious ores, which is the general character of the ores of this district. Being easily fusible and working so rapidly, it increases the capacity of the furnace over what it would be were the ore used alone.

On comparing this with the process employed at the Richmond, it will be seen that hot molten lead is superior to cold lead or litharge in this function, since the latter chills the speiss. The difference in results is chiefly due to this fact. Lead has a greater affinity for arsenic when melted by the heat of the speiss than when added in a molten state, thereby necessitating more calcination preparatory to desilverization. It has been found that lead added in the cold state takes up 10 per cent arsenic while melting with it, whereas lead previously melted absorbs but 5 per cent, making a difference of from two to three days in the time required to eliminate it.

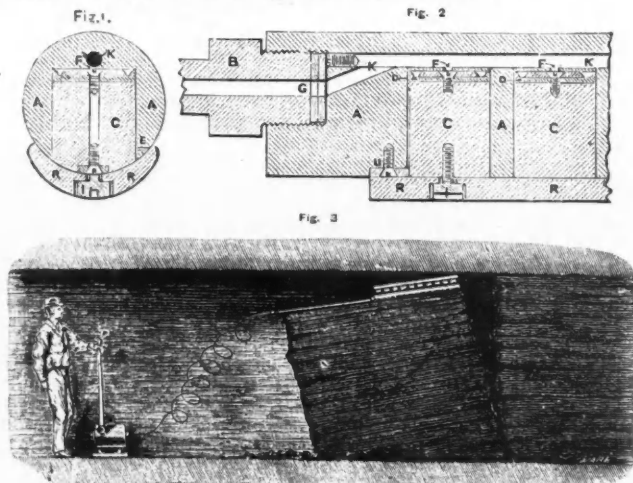
Regarding Mr. Bryant's use of air, to eliminate the arsenic from the speiss, it is not feasible. Nothing practical has yet been found that will withstand the corrosive action of molten speiss under air pressure long enough for even a meager showing.

The labor of two men for every eight-hour shift at wages of \$3 per shift is required, and only fuel enough is necessary to keep the lead needed for treatment in a molten state.

The process has proven an admirable success, and has been the means of materializing the hidden treasures of an enormous accumulation of material heretofore regarded as a waste product.

THE ROBERTS-HORSFIELD-PORTER HYDRAULIC MINING PRESS.

To meet the exigencies of the recent legislation in England, requiring all blasting in coal mines to be done at night when the colliers are out of the pits, a patent hydraulic press, the invention of Roberts-Horsfield and Porter, has been tried, it is said, with satisfactory results at the Kiveton Park Colliery. A mass of coal, 4 feet 6 inches in depth, 4 feet 6 inches wide and 33 feet long, was brought down in about four minutes, with very little noise and without producing enough dust to make watering necessary. To apply the press, the coal is undercut as usual, and drill holes are made near the roof. The press is inserted and pushed to the back of the bore-hole, and water is forced into it from a small hydraulic pump through a connection of copper tubing. In the press are fitted a series of rams which expand when the water is applied, wedging off the mass of coal. The face of the coal at Kiveton Park was very hard, and thus furnished a fair test of the power of the little machine. The promoters claim that no danger attends its use, that it produces no "slack," and that it is 50 per cent cheaper in working than the old methods. It is hoped it will enable the companies to restore their regular shifts, working night and day as formerly.



Roberts-Horsfield-Porter Hydraulic Mining Press.

The details of the press are given in Figs. 1 and 2: A is a cast-steel bar containing a number of circular cavities, in which are placed rams of steel. These rams are fitted in the circular holes of the bar so as to act freely; on the top of each ram is placed a cup-leather D, which is fixed to the rams by means of a screw and metal washer, which latter nearly covers their surface, leaving only a small margin accessible to the influence of the water. Over the head of the screw fastening the cup leather to the ram is drilled a small hole which opens into the waterway K, and by which the water has access to the top of the rams c. The first and last ram in this press has a groove in its outer side which runs nearly up to the cup leather. In this groove fits the prominent part of

the little plate U, which is fixed to the body of the press by means of a strong steel screw. By this arrangement the rams are prevented from falling out when they are forced down. The press, however, is generally used with the rams moving upwards. On the bottom of the foremost and last ram is fixed, by means of screws I, the bar R. The clearance hole in this bar is a little larger than the head of the screw, to permit the latter to have play room. The bar R is made of the same metal as the press. It is crescent-shaped, with a thickness of $\frac{1}{4}$ inch at the bottom, and a height of $1\frac{1}{2}$ inches. It fits exactly round the lower part of the press, as shown in Fig. 2. The object of this bar is to secure an equal pressure to the rams when working against a solid surface. The waterway—Figs. 1 and 2—has a diameter of $\frac{1}{4}$ inch, and is in a straight line, except at the entrance, where it is slightly inclined. The further end of this waterway is closed by a steel screw. The straight waterway enables a simultaneous action to be obtained. To prevent the rams being over-strained after they have accomplished their work, provision is made by means of escape holes E, Fig. 2, in the walls of the cavities on which the rams are placed. To the entrance hole G of the press a hydraulic steam tube B, 2 feet 9 inches long and of 1 inch diameter, is screwed. To this steel tube is fixed a copper tube $\frac{1}{4}$ inch in diameter and of $\frac{3}{16}$ inch bore. This tube may be from 10 feet to 14 feet long, as required, and is fixed with the remaining free end to the force pump. Any hydraulic pressure pump may be employed. The copper tube, spirally bent, is used to secure sufficient elasticity to follow the movements of the press during the process of forcing down the coal. At the distance the pump is placed—about 10 feet from the coal to be operated on—there is no danger to the workmen in attendance. The press weighs only 40 pounds, has a diameter of 3 inches and a length of 22 inches. The presses may be made smaller or larger for special purposes, and the pressure can be increased to suit any case. By this press the coal is not crushed or broken, but shifted down gently, as shown in Fig. 3, and can be removed in large blocks. When the operation is accomplished, the press rests on the top of the coal as shown, the spiral copper tube preventing it from falling or getting damaged.

THE ESTIMATION OF TITANIUM AND PHOSPHORUS IN IRON ORES.

Written for the Engineering and Mining Journal by E. P. Jennings.

I have used the following method in estimating titanium and phosphorus in iron ores and find it shorter and simpler than the one proposed by Dr. Drown.*

From 1 to 5 grammes of the finely pulverized ore is placed in an 18 oz. beaker, and boiled with strong hydrochloric acid, the beaker being frequently shaken to prevent the ore "caking" on the bottom. Most magnetic ores are decomposed in a few moments by this treatment, the titanic acid going into solution, or at least the greater part of it.

The insoluble residue consists of silica, silicates, sometimes a little undecomposed ore, and possibly a little titanic acid.

The solution, without filtering, is diluted with water, nearly neutralized with carbonate of soda, and the iron reduced with sulphurous acid; 50 c.c. of acetic added† and the whole diluted to about 500 c.c. and boiled for an hour. The titanium is all precipitated, together with some phosphorus, a little iron and the insoluble residue from the first treatment with hydrochloric acid.

The precipitate is allowed to settle and is filtered on a ribbed filter and washed with hot water containing 10 per cent of acetic acid,‡ which prevents the titanium from running through the filter.

The filtrate, which contains most of the phosphorus, is reserved for the phosphorus estimation.

The precipitate is dried, ignited and fused, with 10 times its weight of carbonate of soda; the fused mass is treated with hot water to dissolve out the phosphate and silicate of soda; acid titanate of soda and oxide of iron remaining are soluble and are filtered off, the filtrate being added to the first filtrate for phosphorus.

The precipitate of titanate of soda is washed from the filter into a beaker and dissolved in dilute sulphuric acid, nearly neutralized with carbonate of soda, a little sulphurous acid and 25 c.c. of acetic acid added, the whole largely diluted and boiled; the titanic acid is precipitated pure, and should be washed as before with dilute acetic acid.

The phosphorus which is contained in the filtrate from the first titanium precipitate, together with that separated from the titanium precipitate, can be estimated by oxidizing the solution with nitric acid, precipitating the iron and phosphorus with ammonia, filtering, redissolving in hot dilute nitric acid, evaporating to dryness to separate silicon, redissolving in nitric acid and precipitating the phosphorus with "molybdate solution" in the ordinary way.

In case more than two grammes of ore are taken for the analysis the precipitate of ferric hydrate will be too bulky to filter easily, and the following method may be used: The solution is neutralized with ammonia; a few drops of ferric chloride added and the whole boiled; the precipitate of basic ferric acetate will carry down with it all the phosphorus, with the exception of very light traces. This precipitate is dissolved in hot dilute nitric acid, evaporated to dryness, redissolved and precipitated with "molybdate solution" as before.

The advantages of the method are the avoidance of a disagreeable fusion with bisulphate of soda; the ability to work on a large amount of the ore in cases where the phosphorus and titanium are very low; and the saving in time; as an estimation of phosphorus and titanium can be made in 8 hours.

Incandescent Lamps Firing Explosive Gases.—Lieutenant Hutchins, U. S. N., tried a series of experiments to ascertain the likelihood of danger from breaking incandescent electric lamps in explosive gases. Mixtures of hydrogen and oxygen, marsh gas and coal gas with air were exploded instantly upon piercing the globe. A Swan 16 candle-power lamp was used in these experiments.

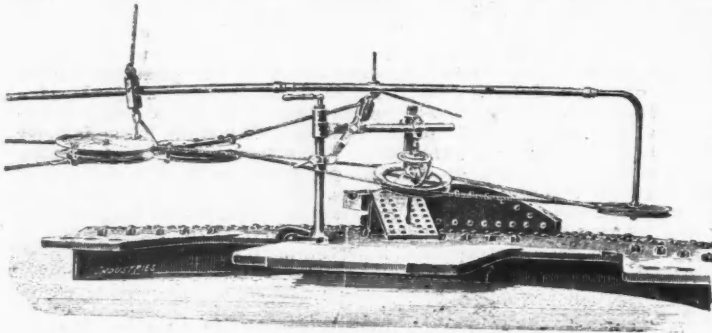
*Trans. Am. Institute of Mining Engrs., Vol. X., p. 137.

† Austin and Wilbur, on the Precipitation of Titanic Acid. Am. Chem. Journal, Vol. IV., p. 211.

‡ Austin & Wilbur, Am. Chem. Journal, Vol. IV., p. 213.

HODSON'S PORTABLE DRILLING MACHINE.

Industries gives an account of a new portable drilling machine, the invention of Mr. Richard Hodson, of England, together with illustrations, one of which we reproduce. It is an ingenious device, and its advantages in work too heavy to be moved to a drill will be obvious. It is adapted especially for drilling holes in line through two plates some distance apart, as, for example, through the shell and furnace plate of a boiler. Its convenience will also be recognized in drilling on bridges and other iron structures, where some form of portable drill driven by higher power than hand, is a great desideratum. This is accomplished in Mr. Hodson's machine by transmitting the power from a countershaft by means of rope gearing. The construction is very simple. A holder is threaded internally to receive the threads of a screw spindle, which is centered by means of a conical head, held in an abutment and collar. To prevent the spindle from falling out, the head is undercut and held in place by a collar-pin. The abutment is carried, and can slide on the arm to which it may be clamped in any position by a screw and handle on top. The bar itself can also be placed at various angles, its inclination



Hodson's Portable Drilling Machine.

being set by simply turning a handle on top of the sleeve, thus providing a horizontal and angular adjustment, in addition to the vertical adjustment of the drill. The upright is clamped to the work operated upon. Motion is transmitted to the drill by means of a rope passing on either side of the grooved pulley shown in the center of the figure. The rope, instead of lying at the bottom of the groove, takes its bite on the inclined surfaces. Within this pulley, which is made in halves, is speed reducing gear, consisting of four spur wheels, one being keyed to the drill holder, another forming part of the sleeve, while the other two revolve loose on a stud fixed to the pulley. When this pulley rotates, and the sleeve is held tight in the bearing, rotary motion is communicated to the drill-holder by the action of these wheels, the speed being determined by the number of teeth in the wheels. To stop the drill without stopping the rope, it is only necessary to slacken a screw, by turning a handle, which relieves the friction between the bearing and the sleeve, allowing the latter to revolve with the pulley. The simple movement of a lever will thus instantly stop or start the drill. Arrangement is made so that the feed motion may be given either automatically or by hand, or it may be automatically stopped by turning the lever which stops the rotary motion of the drill. Power is supplied from a rope pulley on a countershaft, the rope passing over the pulley seen in the left of the illustration, partly round the pulley of the drill, then round the pulley at the end of the telescopic arm on the right, and back to the drill pulley on the other side, returning over the left-hand pulley again to the countershaft. The rope is kept in tension by a draw weight, and the telescopic arm is carried in a cross piece by means of a swivel joint so that it may be shifted into any convenient position, rendering the drill portable within a radius of from 20 to 30 feet without changing the pulley on the countershaft, or altering the length of the driving rope.

The advantages claimed for this drill are its extreme portability and lightness, one man being able to carry it about and fix it; its great power, due to the multiplying gear within the rope pulley, so that large holes may be drilled with only a few pounds tension on the driving rope; its accuracy; and its automatic action and facility of control.

A Prehistoric Canoe Found in Norway.—An ancient canoe has been found in the Tunhövd Fjord, in Valdres, in South Central Norway. It has been, *Nature* says, hollowed out by means of red-hot stones, and is 4½ meters long and 80 centimeters broad. It is in fair condition. The find is of interest, as no other primitive vessel of the kind has been found inland in Norway. The boat will be sent to the Museum at Christiania.

New Nickel Plating Solution.—The following solution for electroplating with nickel is used by several firms in Hainault: 500 grms. of nickel sulphate, 365 grms. of neutral ammonium tartrate, 25 grms. of tannin dissolved in ether, and 10 liters of water. One and one half liters of water are first added, and the mixture boiled for fifteen minutes; the remainder of the water is then added, and the whole filtered. The *Electrician* says: "Solution yields an even, white deposit, which is not brittle, and the cost of which is hardly more than that of electroplating with copper."

Manurial Value of Nitrogen from Different Salts.—Herr G. Klein has described some experiments on the comparative manurial value of nitrogen in form of ammonia salts and Chili saltpeter. The experiments were made in four localities. In three of them the soil was limy and rich in humus, while the fourth was rich in lime and poor in humus. These were all dressed with phosphoric acid and kainite, and plots were arranged without nitrogenous manure and with nitrate of ammonia, or both. With the first three soils the action of the manure was about the same, but with the fourth soil the nitrate was much more effective than the ammonia salts; this failure of the ammonium salts is chiefly owing to the lime in the soil, late sowing, and unfavorable weather.

An artesian well recently opened at Barcaldine, in the interior of Queensland, Australia, is 691 feet 9 inches deep, and yields about 576,000 gallons of water per day. The temperature of the water when it first issued was 120 degrees F., but subsequently receded to 102 degrees.

Haulage in Mines.—At a recent meeting of the Engineers' Club of Philadelphia, Mr. A. W. Shafer gave the cost per ton mile of haulage in anthracite mines as follows: Mules, 1.82 cents; steam locomotives, .6 cent; electric motors, .4 to .67 cent.

Non-Magnetic Alloys for Watches.—To overcome the injurious effect of magnetic action upon watches, M. Paillard, of Geneva, proposes alloys of palladium as substitutes for steel wherever it is employed in the works. The composition of the new alloys varies from 45 to 75 parts of palladium, 15 to 30 parts of copper, 20 to 25 parts of silver, with sometimes the addition of small proportions of iron, steel, nickel, gold and platinum. These alloys are claimed to be unoxidizable in moist air, to preserve their elasticity indefinitely, not to vary sensibly with changes of temperature, and remain uninfluenced by proximity to dynamos.

Exploiting the Graves of their Forefathers.—The British Consul at Mollendo, in Peru, in his latest report states that a limited liability company has lately been formed there, with a capital of about £8000, called the *Compañía Anonima Exploradora de las Hucas del Inca*, with the object of searching for antiquities and valuables in the old Inca burial grounds in the district of Cuzoo, a concession having been granted to the company by the Government for this purpose. The Consul says there is no doubt that many valuable curiosities, and probably deposits of gold and silver, exist in these ancient tombs, but it remains to be seen whether they will pay the cost and trouble of finding.

The Chapman-Brin Submarine Boat.—The *Revue Industrielle* says that a new type of submarine boat has been invented by M. Chapman and the brothers Brin, of Paris, France, in which the heat is supplied by the combustion of a mixture of compressed oxygen and volatile petroleum vapors, either in the hearth of an ordinary steam boiler, or in a machine especially adapted to gas. The oxygen is compressed at 80 atmospheres, a large quantity being thus stored in a relatively small space. The immersion of the boat is accomplished by means of a centrifugal pump, which introduces the water into the hold, and, when the boat is desired to rise, forces it out again through two vertical tubes. The depth of the boat beneath the surface is controlled automatically by means of electricity.

The Greatest Arc Light in the World.—Saint Catherine's lighthouse, on the southern extremity of the Isle of Wight, now possesses the most powerful electric arc-light in the world. The carbon pencils are 2½ inches in diameter, the interval between them ¼ inch, and the light developed equal to 60,000 candles. The lamp is a modification of the Serrin-Berjot type, and the carbons are fluted to promote centrality of the arc. The current is generated by two dynamos constructed by De Meritens, of Paris, the induction arrangement consisting of 60 permanent magnets, each magnet being made up of 8 steel plates. The armature, 2 feet 6 inches in diameter, is composed of 5 rings, with 24 bobbins in each, arranged in groups of four in tension and six in quantity. The revolving lens is constructed so as to refract the light in 16 radial beams, and this is actuated by a small vertical engine at such a speed that flashes of five seconds duration are given every half minute.

Cowles Aluminum Bronze.—Messrs. Browne & Boby, of 11 Queen Victoria street, London, in a letter to *Engineering*, say: "About a year ago, after having bought some few tons of aluminum bronze from the Cowles Company for the purpose of testing its qualities, we ordered 20 tons of it, all of which was to be capable of standing a tensile strain of at least 100,000 pounds (44½ tons) per square inch, with a minimum elongation of 5 per cent.; the order was carried out to our satisfaction; both the strength and elongation specified were exceeded on the average, the quality on the whole being remarkably uniform."

"In ordering this metal, besides its great strength and high elastic limit, its lightness was a material consideration, the specific gravity being only 7.56, against 8.6 that of copper. We venture to believe that no order for bronze has ever been filled under such onerous conditions by any firm except the Cowles Company; in fact, we doubt whether any material in the market except their bronze could satisfy such a specification."

Woodite.—Woodite is a substance bearing a strong resemblance to native india-rubber, but unlike that material, it never grows sticky, and resists the action of oils and heat. If it be placed on the outside of a vessel a shot may be driven through it, and yet it will close up so completely that it is difficult to find the speck which marks the spot where the shot entered. A target is now in view at the offices of the Woodite Company, 13 Delahay street, Westminster, representing the side of two torpedo catchers now building for a foreign government at the works of Mr. Schichau, of Elbing. These vessels have an inner skin, and between the two plates is a layer of woodite about 2½ inches thick. If the material acts as efficiently under these conditions as when applied to the outside of a plate, it will keep the vessel water-tight, even if her side should be riddled. Woodite is coming into use for many commercial purposes, such as delivery valves, air pump valves, packing, wheel tires, and it is said to be far more efficient for these purposes than either leather or india-rubber.

The Harlem Tunnel.—The proposed tunnel under the Harlem River, as recommended by the special commission, is described as follows: The tunnel should be 450 feet in length between the bulkheads—that is, in the main section between the air holes on either side of the river—with approaches each about 1800 feet in length and leading by gradients of three feet in 100 to the level of the bed of the tunnel proper. The entire structure to be in three sections—two large ones for driveways on each side of a smaller section at higher level for footways. The driveways to be about 18 to 20 feet wide by 15 feet high, and the footway 15 feet wide by 10 feet high, the whole to be lighted by electric lights. The approaches are to be by open cuts, in which the footway will be in the middle, between the two driveways and about five feet above them. At every cross street stairways will lead down from viaducts to the footways. The tunnel proper, the southern approach, and most of the northern approach, will be through a formation of solid rock, insuring stability and safety to the structure. Its estimated cost will be \$2,000,000.

What to Read on Electricity.—Thomas D. Lockwood, in a paper just published in *The Electrical World*, and addressed to prospective students of modern electrical practice, gives a list of books on the subject which may prove helpful to many. He recommends twelve works which cover a large range of the science, as follows: 1. Elementary Lessons in Electricity and Magnetism, S. P. Thompson, \$1.25; 2. Elementary Treatise on Electric Batteries, Naudet, translated by Fishback, \$2.50; 3. Electricity—Theory, Sources, and Applications, Sprague, \$3; 4. Domestic Electricity, Hospitalier, \$3; 5. Electricity and the Electric Telegraph, 2 vols., Prescott, \$5; 6. Electricity and Magnetism, Jenkin, \$1.50; 7. The Bell Telephone, etc., Prescott, \$4; 8. Practical Electric Lighting, Bromley Holmes, \$1; 9. Dynamo-Electric Machinery, S. P. Thompson, \$5; 10. The Art of Electro-Metallurgy, Gore, \$2.25; 11. Physical Treatise on Electricity and Magnetism, 2 vols., Gordon, \$10; 12. Modern Applications of Electricity, 2 vols., Hospitalier, \$8.

We have added the prices of the books at which they can be procured from the Scientific Publishing Company, 27 Park Place, New York.

"The American Machines give the Best Results."—The English reports from the Transvaal, South Africa, say that "several large irrigation works are in contemplation in South Africa, and there is likely to be a good demand for water pipes. The mining news is also encouraging. The Kuy-na (Cape Colony) gold fields are looking up, the Oudstroom Company's crushings having produced three-quarter ounce to the ton, and as the working at Kuysna is inexpensive, owing to the ample supply of water and fuel, one half ounce pays all expenses and leaves a clear margin of profit. The Transvaal gold-fields are quickly developing, and the demand for machinery is still very active, but the American machines are said to give the best results. The Cape parliament met at the end of May, and it is stated that railway extension will occupy most of the time of the legislature. There a variety of proposals, but the connecting line between the midland and eastern systems of the colony, by which colonial coal can be carried to Kimberley, and the line through the Orange Free State to the Transvaal, or from Kimberley to Mapeking, Bechuanaland, are those which have the best chance of being adopted. Whatever may be the chances of the different proposals, a large extension of the South African railways is impending."

New Railways in Honduras.—Construction on the Honduras North Coast Railway has been commenced by the contractor, Mr. George E. Mansfield, of Boston. The road is being built under a concession originally granted in July, 1884, by the government of Honduras to W. Allstrom, who organized the Honduras North Coast Railway and Improvement Company in New Orleans. The concession is for 99 years, and grants 9 square miles of land for each mile of line built; also exemption from taxation and the privilege of importing necessary material for construction free of duty. The line surveyed is 150 miles long, the termini being Truxillo and Puerto Cortez, and it passes through extensive forests of mahogany, cedar and iron wood, and will open up the Sierra Madre mountains on their northern slopes. According to the grant the company is obliged to have 75 miles of road in operation by July, 1889. The only railroad in Honduras at present is a line of 33 miles from Puerto Cortez, which is a portion of a projected transisthmian route to the Bay of Fonseca. The Honduras Railway Company has just been incorporated in London to complete this enterprise, and a New York syndicate has been found to construct another line from Truxillo to the Bay of Fonseca, passing through the principal mining districts, and connecting with the capitol, Tegucigalpa.

Photographs of Projectiles.—Reproductions of the photographs of projectiles in flight as discharged from various guns are given in *La Nature* for the 19th inst., and they must be looked upon as marvels of photographic effort, for it is shown that in the one hundred thousandth part of a second the missile must pass over a space of about two inches. The original photographs are about an inch and a half in diameter. In making the experiments to produce these very remarkable pictures the bullet was illuminated in its flight by the light of the spark from the discharge of a Leyden jar. This discharge is brought about by the shot itself, which passes between two points in a broken electrical circuit and brings about two discharges, one of which illuminates the ball itself and the other the surrounding air in front and behind; it is, in fact, the wave of air photographed that gives such interest and value to the representation of a projectile in flight. A rifle bullet can only appear as a rifle bullet, whether held in the hand and photographed or sent on its career of flight and then photographed. We are not writing a treatise on gunnery, yet we can not but draw attention to the singular effect shown—waves of air actually focussed and photographed by means of the difference in refrangibility of the layers of air of varying density caused by the flight of the projectile.

The Cowles Mammoth Dynamo for Use in Producing Aluminum Alloys.—The Cowles Bros.' process of electric smelting is being introduced in England on a magnificent scale. The English and colonial (except Canadian) patents have been purchased by the Cowles Syndicate Company, Limited, and a plant was put up at Stoke-on-Trent, as announced at the time in these pages. The company has in operation a continuous current dynamo of 300,000 watts, built by Crompton. A second dynamo is now to be built, the weight of which is to be 38,000 lbs., and it will be driven through 17 ropes, instead of a belt, by an engine of 800 indicated horse-power. This new machine is to give 402,000 watts when making 300 revolutions per minute. The test is to be made on a fixed resistance for a twelve hours' run, with the exception of a ten-minute stop every two hours, volt and ampere meter readings to be made every five minutes.

This will be far the largest dynamo yet constructed, and will be about double the size of those in the Cowles' works at Lockport, N. Y. The Cowles alloys are meeting with well-deserved success, and are the metals *par excellence* for propeller blades and other uses requiring great strength, elasticity and incorrodibility. They will, we believe, be found the best and cheapest material for cast guns—the guns of the future.

Watkins's Position Finder for Guns.—The control by England of Major Watkins's invention of a position finder is a matter whose importance it is not easy to exaggerate. The Government has given him \$5,000, and £1000 a year for ten years. They bought the invention cheaply at that. The inability of the human eye accurately to measure distances

covered by rifled guns has long been recognized by artillerymen. Inventions to meet the difficulty have not been few, but never have they more than half filled the gap in artillery science. The Watkins invention, however, which was first announced in 1872, has been steadily perfected until it now enables 20 guns to do the work of 320 under the old system. It triples or quadruples the power and rapidity of fire of heavy guns in forts and earthworks. It makes a good artilleryman of the rawest gunner, since it reduces him largely to a machine, and increases the proportion of hits on a moving target a mile or more from shore from 20 to 80. The invention is operated in a directing station removed from a battery and the simple laying of a telescope in this marks on the dial in front of the gunner the exact training and elevation. Consequently an artilleryman need not look out of the port, does not need to see the object, and can shoot as accurately over a hill as in any other direction. One important result of the adoption of the invention is the increased service ability of the old muzzle-loading cannon. It is proposed to fit them with the position finder and load with melinite shells, making them highly valuable up to 4500 yards. Considering the number of muzzle-loaders hitherto looked upon as old iron in forts in the United States this is a matter that perhaps it would be wise for the War Department at Washington to consider.

Queensland Opals.—Opals have until recently been brought chiefly from the Hungarian mines, which produce the pale, milk-hued gems, and from South America, whose gems are also milky but not as brilliant as the Hungarian stones.

About seven years ago a Mr. H. W. Bond first found this beautiful stone in Queensland, Australia, in Cooper's Creek, or Barcoo River, near the eastern boundary of South Australia.

The best opals occur as nodules which are imbedded in gray or chalky earth forming strata in tertiary rocks.

The nodules, which are of very uniform size and shape, have an external crust or shell of a thickness varying from half an inch to an inch, composed of concentric layers of ferruginous silica separated by fine lines of bright yellow color.

On being broken these concentric layers are seen to inclose a siliceous cream-colored kernel of opal which fills the shell.

Layers or deposits of these nodules occur in the Aladdin Hills, and contain opals of the greatest beauty and value, precious opal, fire opal, common opal, wood opal, and hyalite.

These Queensland gems far excel those of Hungary in brilliancy, and especially in the vivid green color which makes the opal such a favorite among gem connoisseurs.

The old superstition concerning "unlucky opals" is wearing away, and these beautiful stones are much in favor at many of the European Courts. Queen Victoria is said to have a great partiality for them, as had also Henry Ward Beecher, who was in the habit of always carrying with him some beautiful gems.

Magnesia Cement.—*The Engineer* says: Attention is being directed to the use of magnesia as a cement. The need of finding some use for the refuse magnesia salts arising as by-products in the manufacture of potash at Stassfurt has caused the subject again to attract attention. The question is of all the more importance in that the other compounds, the chlorides combined with the magnesia at Stassfurt, are valuable for the production of bleaching powder and hydrochloric acid. When Sorel pointed out, in 1867, that a cement could be produced by mixing chloride of magnesium and magnesia, it was hoped that good results would ensue. The composition of this cement was based upon much the same principle as the white stopping used by dentists, made of zinc oxide and chloride of zinc. This cement of Sorel, in spite of many attempts to use it, proved a failure in consequence of a tendency often noticed also in calcareous cements, to swell and blow, owing to deferred hydration. Dr. Grundmann, of Hirschberg, has recently invented a new method of treating the magnesia, for whereas formerly the material was merely calcined and made up with water, he now carefully slakes the calcined magnesia, and subsequently exposes the compound or casting to the action of carbonic acid gas, much in the same way that builders have been in the habit of drying and hardening plastered rooms by confining the air and burning coke in them, so as to liberate carbonic acid gas. The natural carbonate of magnesia, known as magnesite, is a mineral of great hardness and density, and the similar substance obtained by the above treatment resembles magnesite in its hardness and in its capacity for taking a good polish. Grundmann also employs the magnesia as a cementing agent for various materials, for instance, by the use of marble dust an artificial dolomite is obtained. The magnesia can also be improved by adding to it soluble silicates of the nature of water glass, and it can be used as a stucco for building purposes.

DIVIDENDS PAID BY MINING COMPANIES DURING JUNE AND FROM JANUARY 1st, 1888.

NAME OF COMPANY.	Paid in June.	Since Jan. 1.	NAME OF COMPANY.	Paid in June.	Since Jan. 1.
Atlantic, Mich.	.....	60,400	Mary Murphy, Colo.	.....	35,000
Alturas, Idaho	.....	112,500	Montana Ls., Mont.	.....	330,000
Calumet & Hecla, Mich.	.....	500,000	Morning Star, Colo.	.....	25,000
Carlisle, N. M.	.....	50,000	Mt. Diablo, Nev.	10,000	20,000
Central, Mich.	.....	40,000	N. Belle Isle, Nev.	.....	200,000
Colo. Int. Co.	43,500	41,000	Ontario, Utah	75,000	450,000
Confidence, Nev.	49,926	99,840	Original, Mont.	.....	3,000
Cons. Cal. & Va., Nev.	108,000	648,000	Oscoda, Mich.	.....	50,000
Daly, Utah	37,500	262,500	Parrott, Mont.	.....	18,000
Dunkin, Colo.	.....	80,000	Pittsburg, Cal.	.....	29,850
Eureka, Nev.	12,500	87,500	Plymouth Cons., Cal.	.....	80,000
Franklin, Mich.	.....	40,000	Quick-silver, Cal., Pref.	.....	172,000
Garfield, Nev.	.....	25,000	Quincy, Mich.	.....	180,000
Golconda, Idaho	.....	120,000	Sherwood, Mo.	.....	3,000
Granite, Idaho	.....	10,000	Sierra Buttes, Cal.	.....	15,312
Granite Mountain, Mont.	200,000	1,100,000	Sierra Nevada, Idaho	10,000	10,000
Hale & Norcross, Nev.	56,000	112,000	Silver M. of Lake Val.	.....	.....
H. Cla Cons., Mont.	15,000	90,000	Id., N. M.	23,000	25,000
Homestake, Dak.	25,000	150,000	Standard, Cal.	5,000	50,000
Hope, Mont.	.....	50,000	Swansea, Colo.	.....	3,000
Idaho Cal.	46,500	186,000	Tamarack, Mich.	.....	120,000
Iron Silver, Colo.	.....	100,000	Viola Ls., Idaho	.....	37,500
Jay Gould, Mont.	36,000	172,000			
Little Chief, Colo.	20,000	20,000	Total	754,920	5,013,000
Mammoth, Utah	10,000	20,000			

PERSONAL.

Prof. W. P. Blake is still in London on professional business.

Mr. C. H. Aaron, mining engineer, is now visiting different mining camps in California in the interest of the State Mining Bureau.

Mr. Van B. de Lashmunt, who has been connected with and has advanced the mining interests of the North est. has been elected mayor of the city of Portland, Oregon.

Mr. Wm. Beer, who has for some time been connected with the Osceola and Tamarack mines, Lake Superior, is now on his way to Butte, Mont., on professional work.

Mr. J. A. Strickler, of Pennsylvania, has gone to Eagle Pass, Tex., to examine a large tract of coal in that vicinity and report on the coking possibilities. He is employed by the Coruhulia Coke Company.

Mr. E. J. Dowlin, of London, England, is now on his way to Alaska to examine an extension of the Treadwell mine, on Douglass Island. He and his associates intend to erect a 100-stamp mill at once on the property.

The Department of State has been informed that an Inland Navigation Congress will be held at Frankfurt, Germany, August 19th to 25th. The congress is for the consideration of scientific questions relating to an improved system of navigation of rivers and canals, types of vessels, etc. An invitation is extended to American scientists to attend this congress.

Mr. Edmund Smith has resigned as First Vice-President of the Pennsylvania Railroad, and Second Vice-President Frank Thomson has been promoted to that position. Third Vice-President DuBarry was made second, and Fourth Vice-President Green third. The fourth vice-presidency was not filled. Mr. Thomson will continue at the head of the transportation department and of the passenger and freight departments. Samuel Rea was elected assistant to the Second Vice-President, to take charge of the engineering work.

The New York Mineralogical Club proposes to make excursions to various points of interest on Saturday afternoons of the present season. The purpose of these outings is to acquaint the members personally with the most interesting localities of the neighborhood, to secure specimens for the permanent cabinet of the club, as well as for private possession, and to enlarge the influence of the club, by associating with its regular members in these informal trips any persons who may feel an interest therein.

FURNACE MILL, AND FACTORY.

The Virginia Nail and Iron Works Company has blown in its new coke furnace at Lynchburg, Va.

The Jupiter Blast-Furnace in South St. Louis, Mo., operated by the Western Steel Company, was damaged by fire on the 26th inst. to the extent of about \$25,000.

The Swedes' furnace at Norristown, Pa., operated by Richard Hecksher & Sons, was relighted on the 21st inst., after having undergone repairs costing \$50,000.

The Cartwright Iron Company at Alikanna, Ohio, has failed. The liabilities are \$60,000, and assets, \$40,000. Depression of the iron trade is said to be the cause of the failure.

In 1884 the Trenton City Bridge Company painted their iron bridge (127 feet long) across the Delaware River with graphite paint, and inspection now shows that after four years' wear the paint is as good as when it was first put on.

Messrs. Paris Haldeman, C. Ross Grubb and Horace L. Haldeman have entered into a copartnership under the name of Haldeman, Grubb & Co. This firm will continue the manufacture and sale of Chickies pig iron at Chickies furnaces, Chickies, Pa.

Colorado Coal and Iron Company, of Colorado, has made a shipment of steel rails to Washington Territory for the Seattle & Eastern Railroad. This is the first shipment of steel rails ever sent to the Pacific coast that were made west of Missouri River.

Representatives of the brass workers of the United States met in secret session in Pittsburg, Pa., on the 26th inst. The object is to form a national district assembly of the Knights of Labor, and make wages now being paid in various cities more uniform.

In the Superior Court at Pittsfield, Mass., suits were begun by Patrick Meyers, Michael Finn, Michael Kane and John Fallon against the Hudson Iron Company, for injuries sustained by falling down the company's shaft last fall. Myers sues for \$10,000 and the others for \$5000 each.

The Ajax Lead Coating Company has been organized at Philadelphia, Pa., with a capital of \$1,000,000, to develop the Lanier and Hendrickson patents for coating metallic surfaces with lead. The company will erect a large plant immediately, and establish branch works and lease rights under the patents.

George M. Pullman, President of the Pullman Palace Car Company, has concluded the purchase of the entire Baltimore & Ohio system, including a contract for the operation of Pullman cars for twenty-five years. The price paid is understood to be about \$1,200,000. The cars will be run in vestibule trains as soon as practicable.

A newly formed company at Paterson, N. J., has purchased Dr. Raub's patent for his central power engine, the first of which was constructed at the Grant Works some two years since, and which it is claimed, has proven a great success. It is said that ten of the engines will be built at the Grant Works as soon as the new company is ready to begin operations.

A fire at the Isabella Furnace at Isabella Station, Coester County, Pa., destroyed the screen-house, coal-house, ore-house, and other departments of the furnace, with the valuable machinery, entailing a loss of over \$50,000, fully covered by insurance. The furnace is owned by Col. Joseph D. Potts, of Philadelphia. The machinery and buildings were all new. The fire originated among the charcoal.

For several months past the Glendon Iron Company, Easton, Pa., has been making brick from hot cinders that come from the furnace, recently the wages of the brick-makers were reduced and all of them quit work. The company has notified all of its ore contractors in Williams township to quit delivering ore at the works on the 30th inst. It is thought that this means that the company has poor prospects of putting its four idle furnaces in blast.

It is reported that Erastus Wiman has sold the patent rights of the Cyclone pulverizer for France, Italy, and Belgium for £40,000, or say \$200,000. Considering that the Cyclone pulverizer presents little that is new, and that its essential principles have been tried again and again and rejected as being too expensive in repairs, it would seem that the transaction to the purchasers is not likely to prove much more remunerative than an ordinary wild cat mine.

Mr. Albert H. Griggs, Superintendent of the locomotive and car department of the Providence & Worcester Railroad, has been trying upon engine 15 an exhaust damper at the base of the stack, and finds a material economy in its use. His record of two weeks' trial shows miles run per ton of coal with the damper, 63.42; without, 56.94; pounds of coal per mile with damper, 34.68; without, 38.64; pounds of coal per car-mile with damper, 12.79; without, 14.72.

The pattern shop and bending mill of the Delaware Iron Works, at New Castle, Del., which are operated by Morris, Tasker & Co., Limited, of Philadelphia, Pa., were destroyed by fire on the night of the 27th inst. The fire was caused by an experiment in painting pipe with a mixture of benzine, coal tar and oil. A spark fell into the composition and instantly the place was in flames. The company manufactured iron pipe exclusively and was experimenting with the paint composition with a view to labor saving. All the patterns of several years' accumulation and which can not be replaced were destroyed. The loss on patterns is estimated at \$40,000 to \$50,000 and on building \$5000. The losses, it is said, are partially covered by insurance.

At a meeting of the Bethlehem Iron Company, held at Bethlehem, Pa., on the 26th inst., the report of the President showed a very material falling off in the output and profit. The profits during the past year were hardly sufficient to pay the interest on the runned debt and the dividends to stockholders. The following were elected directors: E. P. Wilbur, Robert H. Sayre, Sr., Robert P. Linderman, W. W. Thurston, Joseph Wharton, John Knecht, and George H. Myers. W. W. Thurston was then elected President; R. P. Linderman, Vice-President; Robert H. Sayre, Sr., General Manager; John Fritz, General Superintendent; C. O. Brunner, Treasurer, and A. S. Schopp, Secretary. The steel and rail mills of the company, which have been idle for several weeks, resumed work on the 25th inst. The puddling mill is still idle.

CONTRACTING NOTES.

Machinery and supplies wanted. See page xiv. Contracts open will be found on page xix. New contracts this week: No. 945, Construction of Iron Bridge and Substructure; No. 946, Water-Works Construction; No. 947, Bridges; No. 948, Dredging and Swamp Improvement; No. 949, Lehigh Coal; No. 950, Dredging.

The Philadelphia Gas Improvement Company has been awarded the contract for supplying the city of Philadelphia with 3,000,000 cubic feet gas by the Hanlon & Leadley process, at the rate of 37 cents per 1000 feet of 22 candle power. The company will at once proceed with the erection of a plant costing \$250,000. The city under the contract reserves the right to absorb the plant at a reasonable figure in case it should be so desired. The Hanlon & Leadley offer was 5 cents per 1,000 feet lower than the next lowest offer, and 12 cents lower than the highest bidder.

The Trenton Iron Company, of Trenton, N. J., has made the following contracts for the erection of wire-ropes tramways of the Bleichert improved system: A three and one half mile tramway, with a capacity of 600 tons per day, for the Solvay Process Company, of Syracuse, N. Y.; another one, 1250 feet long, for the Pottsville Iron and Steel Company, of Pottsville, Pa., and a third one for the Edgewater Lime Company, of New Jersey; and an inclined tramway for the Poughkeepsie Horsehoe Company, of Poughkeepsie, N. Y. This business shows the advantages which manufacturers receive from advertising in the ENGINEERING AND MINING JOURNAL. We are informed by the company that they have already received nearly 200 applications for particulars of their Bleichert tramway, nearly all of which came to them through the ENGINEERING AND MINING JOURNAL.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including June 20th, as reported by the Marquette Mining Journal, were as follows:

	Tons. 1888.	Tons. 1887.
Marquette, Marquette District.....	89 161	192,901
St. Luce,	35,403	26,110
Escanaba,	186 281	233,446
" Menominee District.....	243,624	280,076
" Gogebic District.....	61,114	.....
Ashland.....	161,383	218 381
Two Harbors, Vermillion District ..	52 354	71,271
	835,348	1,022,089

SOUTHERN PACIFIC RAILROAD COMPANY.—It is reported that this company will soon erect immense coal bunkers at West Seattle, where it has secured an extensive water front, convenient to the Carbonade coal mines.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—It is reported that at the meeting of the stockholders of this company at Nashville on the 28th inst., \$8,250,000 out of \$9,830,000 of the stock voted to issue the \$600,000 of first-mortgage bonds. The plan is said to be this: the company has 170,000 shares of stock in the treasury and it proposes to buy 830,000 shares pro rata from the stockholders at 30. The company will then have 1,000,000 shares, which will be converted into mortgage bonds.

ALABAMA.

The strike at Pratt coal mines is over, and the men have returned to work. The settlement was a compromise, the men agreeing to accept a sliding scale. They return to work at 45 cents per ton, this price being made on a basis of \$13 per ton for iron and the rate to be increased five cents per ton for every advance of \$2 per ton on iron. This sliding scale contract is made for twelve months, the men having the option of continuing it for one or two years longer.

ARIZONA.

GRAHAM COUNTY.

Mr. Matt Calhoun, of Watrous, N. Mex., who is backed by an English and American syndicate, is reported to have bonded Colonel Ingram's group of twenty mines at Gold Gulch for \$30,000. This group consists of copper, gold and silver prospects. He also bonded Charley Stevens' group of nine mines in Chase's Creek, above the Metcalf, for \$10,000.

PIMA COUNTY.

PEERLESS MINING COMPANY.—It is reported that high-grade ore has been struck on the 300-foot level of this mine at Quijotoa. This proves, it is said, the continuity of the pay vein in the mountain from the surface down to that depth, for the same lead of ore has been tapped on the 100 and 200 foot levels.

AUSTRALIA.

BROKEN HILL PROPRIETARY COMPANY, LIMITED.—The San Francisco News-Letter says: The Broken Hills mining excitement in Australia recalls the old bonanza days in California. Within the short space of a year and a half the town itself has grown from a small hamlet into a place of importance, with a settled population of over 10,000 people. Silver kings have sprouted like mushrooms, shares in the mines advancing rapidly on the wonderful ore development. In the great Broken Hill mine the original shares were quoted at \$50, at present they are worth all the way from \$1,500 to \$2,000. This mine formerly consisted of four 40-acre blocks of land. Two of these were recently floated in London for \$5,000,000, which amount was divided pro rata among the present shareholders in cash. The shares in this London company are now quoted at \$10 premium. There is extensive machinery at the mine, and over 1000 men are employed at \$2.50 per day of eight hours. The wages paid at the works average from \$20,000 to \$25,000 per week. The manager, Mr. Patton, formerly of our Nevada mines, has a salary of \$30,000 per annum. The hullion is shipped to London. The ENGINEERING AND MINING JOURNAL published a description of this bonanza in its issue of November 13th, 1886.

CALIFORNIA.

CALAVERAS COUNTY.

Our special correspondent at Angel's Camp writes us as follows: The mining lookout in this vicinity is very bright at present, every mine that has been prospected lately having proved a success. There are a number of mines, also on the mother lode of California, in this vicinity now lying idle which have just as good indications for a success as those now being operated on; all they want is capital to develop them. All the mines and mills here are running up to their full capacity, and doing well.

The cost of mining and milling is very small, the mills being run by water power, and the cost of lumber for building mills, etc., is only \$16 per thousand, delivered at the mines.

CONFIDENCE.—This mine has been bonded to San Francisco parties, after 2 months prospecting, they were so well pleased with the results that they are now putting up a 10 stamp mill.

EUREKA.—The Eureka mine, which was purchased a short time ago by Messrs. Hayward & Hubbard (owners of the famous Plymouth mine) is going to have twenty more stamps added to its twenty-stamp mill.

MCCREIGHT.—This mine, to which the ENGINEERING AND MINING JOURNAL referred in its issue of the 23d inst., continues to turn out its large yield of gold. Its ten-stamp mill has turned out over \$25,000 for the last fifteen days' run. Messrs. Hayward & Hubbard have just purchased two thirds interest in the mine; the other one third could not be purchased for

\$100,000. The way the mine looks now, there is no telling how much gold will be taken out within a short time, as it keeps on improving in going ahead.

MONO COUNTY.

BODIE CONSOLIDATED MINING COMPANY.—At the annual meeting recently held in San Francisco the following officers were elected for the ensuing year: W. P. Willard, President; George I. Ives, Vice-President; George W. Sessions was re-elected Secretary and Capt. John Kelly Superintendent.

NEVADA COUNTY.

ORIGINAL PITTSBURG (GRASS VALLEY) GOLD MINES LIMITED.—This company, the organization of which we published in our issue of May 26th, has paid the first installment on the purchase price of the Pittsburg Mine. Mark L. Elliot, the superintendent, is now at Grass Valley and has instructions to push underground work. A Pelton wheel for hoisting purposes is to be put in and the landing raised to make space for depositing waste rock. Trails are to be laid in the shaft and then sinking will be in order. When ore in quantity and of quality warranting the reconstruction of a ten-stamp mill and the addition of ten stamps shall be found, such work will be done and not before. The company's business office will be at Grass Valley. Fifty thousand dollars will be spent in developing the property.

CANADA.

PROVINCE OF NOVA SCOTIA.

It is stated that the coal from the Gowrie has proved a success for coke making. The coke turned out by the two ovens has been so favorably received that 12 more ovens are to be built forthwith. This will make 14 ovens in all, and marks a new departure for Cape Breton. It is reported that orders have been received for all the coke the company can make.

COLORADO.

CLEAR CREEK COUNTY.

MASCOTTE GOLD AND SILVER COMPANY.—The secretary has advised us that the statement published in our issue of June 23d in reference to this company is not correct. He says: "The Seaton Mountain Mining Company has not served any papers in ejectment on our company, nor have they any intention of doing so. The report has no foundation whatsoever, and was simply concocted by a newspaper printed at Idaho Springs to injure the interests of the Mascotte Company."

CUSTER COUNTY.

SECURITY MINING AND MILLING COMPANY.—It is reported that the property of this company of Silver Cliff is to be sold at public auction by the sheriff of Custer County.

LAKE COUNTY.

ADAMS MINING COMPANY.—The daily shipments amount to 100 tons of silver-bearing lead carbonates, about 30 tons of which are taken from the Discovery shaft, and the balance from the Brookland. Together with this the mine produces daily an average of 60 tons of concentrating ore, which is successfully treated in the mill connected with the property. The headings of the mill average 15 tons per day. There are 115 men employed in the mine.

DINERO MINING AND MILLING COMPANY.—Work continues steadily. The main shaft is being sunk rapidly under contract to its present destination, which will give the mine a depth of 100 feet more than it has had.

SMALL HOPES CONSOLIDATED MINING COMPANY.—At a meeting of the stockholders of this company held on the 26th inst. in this city, the old board of directors were re-elected, with the exception of Judge H. B. Denman, who retires on account of ill health, and is succeeded by Logan H. Root.

OURAY COUNTY.

BLACK GIRL MINING COMPANY.—It is stated that Mr. Farish has adversely reported on this mine, which he has recently examined for a St. Louis company, to the organization of which we referred in our issue of the 2d inst. The Black Girl is said to be a good property, but not worth \$100,000.

PARK COUNTY.

BROWNLOW MINING AND MILLING COMPANY.—The Nestor Mining Company is now a thing of the past. It is now the Brownlow Mining and Milling Company, says the Fairplay Flume. About ten men are employed, which number will shortly be increased to thirty. The work on the new 100-foot shaft will shortly be commenced. It has also leased all of the Troy Company's property in the vicinity of Park.

SUMMIT COUNTY.

SWAN RIVER GOLD AND SILVER MINES, LIMITED.—This company has been organized in London with a capital stock of £200,000, shares £1 each. The object is to purchase the freehold mines and minerals, with the mining and other rights and privileges appertaining to the same, under and over lands situate in Swan River mining district, Summit County, and to carry on the business of mining and smelting in all its branches.

DAKOTA.

LAWRENCE COUNTY.

The General Merritt and the Bullion Mining companies, have leased the Hartfield smelter, located at Galena, to work the ores of these two companies' properties.

CALEDONIA GOLD MINING COMPANY.—The report for the year ended April 30th, 1888, presented at the annual meeting held at San Francisco recently, shows that the surplus from last year was \$42,000.33; the

production this year was \$295,816.85; the expenses for the same period amounted to \$295,946.14, leaving a surplus of \$72,771.64. In his report Mr. F. L. Skinner, the superintendent, says: "Our litigation has almost all been settled or compromised during this year. All litigation on the south end of the Caledonia, which alone affected the ore-bodies, has been adjusted at comparatively small cost, much less than trial of the cases would have necessitated; besides, in the compromises, the titles to the outstanding interests in the conflicting claims have been secured. On the north end of the Caledonia there is still pending a conflict with the Mono. I don't think this conflict at all material, nor do I consider the ground of any value. If we cannot purchase the conflicting interest for a small sum, I would advise either a trial, or abandonment of the piece of ground in conflict, and pressing the Caledonia to a patent. Besides this action there is another pending against the company for \$1900, claimed by the plaintiff to be due under a contract made by Mr. A. J. Rigby, a former superintendent. This is all at present left of our litigation. The mine is still being worked upon the same system as heretofore—leaving pillars of ore to support the walls instead of using timbers. The bullion production for the year was \$295,816.85, being the proceeds of 73,425 tons of ore milled, making the yield per ton \$4.02, and the amount milled for each stamp during twenty-four hours 33885 tons. This includes the time of all stoppages of the mill by accident or to clean up. The cost of mining the ore for the mill is \$1.44 per ton. This is the actual cost of breaking the rock in the mine and supplies therefor, and putting it into the mill, and does not include any salaries nor any dead work of any kind. The cost of milling, \$466 of a dollar per ton. The dead work yielded some little ore for the mill. At our present rate of milling there is more than five years' supply of ore in sight. In addition to this ore there appears to be another chute of profitable ore distinct from all those now developed in the mine. At present development has been carried on to such a slight extent upon this chute that I am not able to give any information upon the matter. The great burden of our deadwork is done, and the mine is now being run upon the smallest possible expense, and is in perfect condition. In addition to our regular expenses for the year I have built a new ore bin and put up a No. 6 Gate's crusher. The bin was a necessity, the old bins being worn out; the crusher cost, laid down here with shafting, etc., over \$5000; the entire bin about \$10,000, with crusher. The crusher does all the work for our mill and can easily do the work for any increase of stamps you may decide upon, and saves in labor in the mill and mine and other expenses about \$27 a day. We also have on hand supplies of fuel for about seven months. The mill will have to be repaired to some extent this year, new mortar, blocks, etc., being required, and while this is being done, I urgently advise increasing the milling capacity by at least 20 stamps. This will increase the output one third more, and not increase the expenses more than about one sixth, and the quantity of ore now developed in the mine fully justifies it, and will enable the mine to pay a good monthly dividend as long as the ore lasts." It has been decided to add twenty stamps to the 60 now constantly dropping, and it is probable that they will be in operation by August 15th. The amount of prying ore in sight in the mine justified the increase in the present facilities for milling.

IDAHO.

SHOSHONE COUNTY.

Work at the Stenwinder and Sierra Nevada mines has been temporarily suspended. The present price of lead and the high rates demanded for the transportation of ore have made, it is stated, this suspension of work absolutely necessary. The superintendent has stated that after putting the ore on the cars at the company's expense, it is subject to a railroad freight rate of \$22.50 per ton in having the same conveyed to market. The companies, while determined at present not to take out any more ore for shipment, will continue development work on both mines.

COEUR D'ALENE SAMPLING WORKS.—These works at Coeur d'Alene City have started up. They have a capacity of from 100 to 200 tons per day, depending on the nature of the ore. In addition to sampling of ore, the works do custom assaying and analytical work.

ILLINOIS.

ST. CLAIR COUNTY.

As the miners at Daniel Marsh & Son's coal mine, at Belleville, were quitting work on the night of the 25th inst., the hoisting rope broke and left following five men fall eighty feet to the bottom: Edward Hoffman, John A. Wottoma, Charles Weisser, George Weisser, Oscar Merrill. The last two named cannot live, while the others are in a dangerous condition.

KENTUCKY.

MEADE COUNTY.

A company has been formed to pipe natural gas from Brandenburg to Louisville, but the question is as to whether or not sufficient capital for the purpose can be raised there. If not, it will be sought elsewhere.

MEXICO.

The Mexican *Financier* reports the following: A concession has been granted to Adolfo Kindt for the exploration and working of mines of all kinds, gold placers and deposits of hard coal in the Municipality of Santiago, Territory of Tepic, within an area of 4228 by 4228 meters. The Department of Public Works has granted the

following concessions: To Messrs. Gaspar Sales & Felipe Arellano for the exploration of the auriferous zone, and of mines of every class, which may be found at Piedras Verdes, Canton Arteaga, State of Chihuahua, within a space of 20 by 15 kilometers. To Wentz Wilson for the exploration of all kinds of mines, gold placers and coal deposits in the Alcaidia de Santa Cruz de Alaya of Sinaloa, within a space 16 by 10 kilometers. To Juan Ortiz for working of mines of every class in the Mineral de Naica, Camargo District, within a space of 20 by 15 kilometers.

The Legislature of Durango has relieved from taxation, direct or indirect, the capital of \$100,000 to be invested by Hilario Lozoya, or the company he may organize for the working of the Guanacevi mine. The condition affixed to this exemption is that Mr. Lozoya, or the company he may organize, shall build within four years a wagon road from Guanacevi to Farral or from Guanacevi to some convenient point on the road connecting Farral and Carmen.

MICHIGAN.

ROPES GOLD AND SILVER MINING COMPANY.—Over half the capital stock of the company has been deposited in the Ishpeming banks under the agreement to sell to Detroit capitalists, which was published in our last issue.

COPPER MINES.

We learn from well-informed sources the following:

CALUMET & HECLA MINING COMPANY.—The mine is now being pumped out at the rate of about 3,500,000 gallons a day, while it is estimated that every foot in depth, where stoped, contains 500,000 gallons. It is understood that the ground has been stoped out to the 2800 level; below this the water will be more quickly lowered.

Calumet shafts Nos. 4 and 5 and Hecla shafts 3 and 4 have not been much damaged and are being put in order for hoisting, which may be resumed in August.

Calumet shaft No. 3 is nearly all caved in below the 10th level, the Man engine shaft and shafts Nos. 2 and 1 Calumet and 1 and 2 Hecla, and Hecla Man engine shaft, are all greatly damaged. Calumet shaft No. 5 was found to contain a mass of solid ice 30 to 50 feet in thickness, through which an upraise had to be made.

The water was up within a few feet of the 24th level, when the mine was first entered after the fire, but it subsequently rose 75 feet before the pumps could be put in full operation. The progress in lowering the water is necessarily slow, and full ore output cannot be had from the mine for many months to come.

It is said that Mr. Whiting, the new and excellent manager, is making some changes, and we may feel certain for the better. The Calumet & Hecla is understood to have good men at the mines, but the Boston management has never given them a chance to do any thing. Now, it is said, Mr. Whiting is to have full control and he is a gentleman of great and successful practical experience. It is to be hoped, and may now be expected, that the cost of mining, etc., at the Calumet & Hecla will be so much reduced that the officers will not be ashamed to publish the annual reports, for we can not but think that they have thus far refused to give their stockholders this information (which every trustee is bound in duty to furnish), only for mere shame at the exposures such publication would have brought on the administration.

From another source we learn concerning the work being done at the several Lake mines, that all of the producers are doing their best. "Calumet & Hecla is very rich for a not excessive length in the Black Hills mine. It must necessarily be a good while before work can be resumed in the lower workings of the old mine. Once in good working order, however, their capacity will unquestionably be beyond all reasonable requirements.

FRANKLIN MINING COMPANY is said to be looking fairly. **OSCEOLA** averages pretty steady, although the changes are almost constant. **COPPER FALLS** is working the Ashbed at a profit, and is now undoubtedly run for all it is worth. **ATLANTIC** is as poor as ever, and making better products than ever. With close and hard work Atlantic does well. **ALLOUEZ** is being renovated above and opened underground, and probably for the first time in its history will get a fair chance to show what it can do.

QUINCY MINING COMPANY is looking well. A very good mine is Quincy. When they have a new stamp-mill and make an output of rock equal to the capacity of the mine, they will show better figures than ever before in operating costs.

TAMARACK MINING COMPANY is keeping about steady. The mine is said to open satisfactorily; the more extensive the workings, the better the average yield from the mill.

ALLOUEZ MINING COMPANY.—Forty-five men are at work underground in this copper mine, and production will be in order as soon as the surface works are ready.

CALUMET & HECLA MINING COMPANY.—A Boston correspondent of the *Calumet News* says: "The new manager is reported to be quite a hustler, and if rumors are true, there is likely to be considerable anxiety at the take among the officers and men who have had a fat snap for doing half a day's work for a day's pay. Mr. Whiting is reported to have sent around to the Atlantic and Franklin mines for figures and information in regard to the amount of work accomplished per man, and, on comparing the same, found the result very unsatisfactory from his standpoint. He has also countermanded large orders for machinery in Philadelphia. This seems to indicate a decided change in the management of the mine. I

hear from good authority the dividends for 1888 will be \$25. Up to the middle of June 65 pounds of native silver had been picked from the copper rock produced from fifth and seventh levels of the Calumet & Hecla mine.

CALUMET & HECLA SMELTING COMPANY.—At the annual meeting of this company, held at Waterbury, Conn., it was decided to proceed at once with the construction of four additional furnaces at the works near Lake Linden. The building, which is to contain the additional furnaces, will be of the same style and size as the three already built, and the furnaces will be similar to the three already in use. This addition will, when finished, make a total plant of sixteen furnaces besides the blister furnace and cupola. The present plant will not be adequate to the needs of the Calumet & Hecla when that mine is once more in complete working order. It is proposed then to smelt not less than 3000 tons of mineral per month. At the present time there is not quite mineral enough to keep all the twelve furnaces working steadily, so the whole plant was occasionally closed down for a day in preference to stopping one furnace for several weeks. Besides the new furnace building the company will also construct a new dock 100 by 200 feet. This dock will lie southwest of the present dock, from which it will be separated by a slip large enough to accommodate vessels.

CENTRAL MINING COMPANY.—The mass of copper lately struck in this mine is estimated to weigh nearly 200 tons.

HURON MINING COMPANY.—The treasurer of the company, Mr. D. L. Dennison, states that, owing to a confusion of accounts resulting from the destruction of the stamp-mill and other misfortunes, and the necessity of returning them to the lake for revision, no report could be prepared in season for holding the annual meeting at the usual time. And since the directors own control of the stock, and hold over if there is no election, it was decided to hold no election and make no annual report.

IRON MINES.

COLBY.—A steam shovel has been brought into requisition at this mine, in loading ore from the stock-piles into the cars. The Colby is the first mine in the Upper Peninsula to use the steam shovel for this purpose, and the innovation is said to have been a very successful and profitable one. Nearly seventy cars, or about 1500 tons of ore, can be loaded to a shift and the cost is about one fourth the cost of the old way. From 2500 to 3000 tons are now being shipped daily. The shipments so far amount to about 140,000 tons.

PENTAGON MINING COMPANY.—This company has been organized, with the following officers: W. S. Johnson, Sault's Bay, Mich., President; W. L. McGee, Hurley, Vice-President; D. R. Griswold, Battle Creek, Mich., Treasurer; D. L. Allen, Kalamazoo, Mich., Secretary; Chas. H. Whitford, Mining Superintendent, and D. L. Allen, Business Manager. The company has purchased the option on the property known as the Newberry, the machinery and all the rights pertaining thereto, and paid off the debts. Considerable work has been done on the property by Mr. C. H. Whitford, who had bonded the property. The shaft is down about 134 feet in a fair quality of ore now, and improving.

REPUBLIC IRON COMPANY.—The new compressor plant built for this company by the Rand Drill Company, of New York, is a massive plant, four flat cars being required to transport it from the factory to the mine. With this addition to its air-compressing plant the mine will be one of the best equipped in this respect in the iron district.

MONTANA.

DEER LODGE COUNTY.

HOPE MINING COMPANY.—We are officially advised that the production for May amounted to \$22,906.53, and to \$104,355.84 for the first five months of 1888.

SAN FRANCISCO MINING COMPANY.—A rich strike is reported to have been made on the 400-foot level.

JEFFERSON COUNTY.

CENTRAL MONTANA.—According to reports, Mr. E. Edgerton, President of the Second National Bank of Helena, and Dr. C. K. Corl have sold a controlling interest in this placer mine, Basin Creek, for \$100,000.

LEWIS & CLARK COUNTY.

HELENA & LIVINGSTON SMELTING AND REFINING COMPANY.—This company, to the incorporation of which we referred in our issue of the 9th inst., has bought the Dr. Cole ranch of 320 acres on the Prickley Pear and a whole section of land adjoining from the Northern Pacific Railroad, and here the smelting works to be built by the company will be erected. The tract purchased comprises nearly 1000 acres of land and is most eligibly situated for the purpose. The Prickley Pear Creek runs through it, affording a bounteous supply of water, and the land lies on both sides of the Northern Pacific Railway track. The Montana Central Railroad also touches it. Work will be commenced at once, under the supervision of Mr. A. Raht, the metallurgist. Mr. James L. McKay will have charge of the construction. It is thought the works will be in operation by next December. The site of the works is about four or five miles distant from Helena.

MADISON COUNTY.

MONTANA HYDRAULIC COMPANY.—This company has purchased the Washington bar, between Red Bluff and Virginia City, in Madison County. It consists of 1500 acres of patented land and about 2000 acres of unpatented land. There are nine ditches and 10,000 inches of water. It is approximated that there are 40,000,000 cubic yards of gravel, which, judging from thorough tests made, will average \$2 a yard.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED GOLD AND SILVER MINING COMPANY.—It is stated that the company has \$146,000 cash in bank, and confidently expects to have \$500,000 surplus by Sept. 1, if not earlier. Whenever that sum is reached a dividend of \$2 per share will be declared, most likely in time for payment in August. And the programme is to pay \$2 quarterly, or \$800,000 per year. The estimated surplus of \$500,000 is above the July coupon and the second payment of \$37,500 on account of the purchase of Clark's mines and works in Montana, due in August. These payments are due every three months—May, August and November, 1888, and February, 1889. Payments are made from current income, and there will be really no need to sell any bonds for this purpose.

LEXINGTON MINING COMPANY.—Official advices to us show that the production for May amounted to \$12,794.73 in gold and \$71,770.44 in silver, making a total of \$84,565.17, and a total of \$440,353.90 for the first five months of 1888.

NEVADA.

Mr. E. J. Butler, who has received the agency for Nevada of the Monarch Tool Company of St. Louis, Mo., for its machinery, proposes forming a joint stock company for the sale of well-boring machinery, and contracting for sinking wells, and demonstrate that water can be obtained in every valley in the State.

ELKO COUNTY.

As soon as the new boiler is put in the mill lately at work on ore from the North Belle Isle mine, the use of the mill will be given to the Nevada Queen mine for a month or more to enable that company to accumulate a surplus to meet its proportion of the cost of the new concentrating plant and a new mill to be erected. A very large quantity of ore has been accumulated and is ready to mill.

COMMONWEALTH MINING COMPANY.—The drift, 15 foot level, has reached the Queen line. The face of the drift is still in ore, looking good. A four-ton sample from five feet in width, without assorting, was sent to the mill, and, it is stated, pulped from the battery \$256 per ton.

NORTH BELLE ISLE MINING COMPANY.—For the week ended the 19th inst., there were shipped 92 tons of ore to the mill, and the average assay value of the battery samples was \$118.15 per ton. Crude bullion valued at \$26,000 was on hand.

TORNADO CONSOLIDATED MINING COMPANY.—At a meeting of the company held on the 15th inst., Mr. W. H. Quick was elected secretary. It is said that this stock is being purchased largely in Europe, and that the work will be resumed in the mine early this fall, perhaps in August.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—This company, in answer to the request of John W. Pearson to the San Francisco Stock and Exchange Board that the management of that company be investigated by the board, has sent a communication to the board inviting a most careful investigation of its affairs, and the board will probably make such an investigation.

HUMBOLDT COUNTY.

ADELAIDE COPPER COMPANY.—We are officially advised, under date of the 14th inst., that since the last report, published in the ENGINEERING AND MINING JOURNAL May 12th, the company has met with many unforeseen difficulties usual with all new enterprises. On starting the furnace it was found that the ores, taken as a whole, were more siliceous than it was thought, and such fluxing material as was found in the district did not carry sufficient iron. After considerable time and money spent in scouring the country, some very fine iron ore was found near the Overland Railroad, and in large quantities. A car load was mined and shipped to the works, and another start made. The results fulfilled our most sanguine expectations, leaving nothing more to be desired in the way of flux, and proving that the ores can be successfully and profitably worked. The copper bullion carries 52 ounces in silver per ton. Another difficulty staring us in the face is our water supply. We have been depending on the water of the creek flowing into a reservoir for our supply. As the warm weather comes or we find it decreasing. We are now enlarging and sinking to the bed-rock, and from present appearances this water question will be satisfactorily settled.

The mine is proving to be a large property, and, so far as developed, we believe it has the largest body of ore in the State, if not on the coast. We have drifted on the east wall 100 feet, and cross-cut west, 52 feet, and as yet see no signs of a west or foot-wall; besides, we have run several other cross-cuts, all in ore, the richest ore being in the bottom of the drifts. As the drifts are in ore, they have been run of large size, from 6 to 10 feet wide. This body of ore extends within a few feet of the surface.

Although the company is incorporated, the stock is owned by the managers, Messrs. Roulstone & Bates, who, with their limited means, have brought the property up to its present standing. They would like to sell an interest in the property.

STOREY COUNTY—COMSTOCK LODGE.

We condense the following from the Virginia City Chronicle: Ore shipments from the Comstock lode mines over the Virginia & Truckee Railroad to Carson River stamp mills average above 1000 tons daily, requiring a train of 123 cars to move it. Of that number 55 are required to move Consolidated California & Virginia ore. The daily product of the lode averages 1125 tons. The Sutro Tunnel collects out of the total ore product \$1125 per day for royalties, and the railroad company about \$1250.

CHOLLAR MINING COMPANY.—The official statement of the ore worked and bullion produced at the Nevada mill for account of the Chollar mine has just been published. The number of tons worked was 1500, yielding bullion of the assay value of \$24,551.60. The cost of reducing the \$10,500 and the net proceeds in bullion were valued at \$14,051.60. The average assay value of the ore per ton was \$21.73, and the gross average per ton in bullion was \$16.36. The net average per ton was \$9.33.

DEXTER.—Ore assaying above \$30 per ton, of which a large percentage is gold, has been developed in this mine, which is located north of what was formerly known as the Cole mine, from which ore was extracted in the early history of the lode, yielding bullion valued at \$250,000. The development in the Dexter is supposed to be the northern continuation of the Cole vein. The Dexter is being explored through a tunnel in the ravine north of the Cole, and the development was made in a south drift from the tunnel line following the vein. The mine is owned principally in New York.

HALE & NORCROSS MINING COMPANY.—During the week ended the 18th inst. there were hoisted 1436 tons of ore from the 600 and 700 foot levels, and have shipped to the Mexican mill 983 tons, and to the Nevada mill 442 tons. Average battery assay, per ton, \$33.56. The stopes throughout the mine continue to look well. The connection with the Savage mine in the north drift, 400 foot level, has been finished, and work has been resumed in No. 1 east cross-cut on this level. There is bullion on hand and previously shipped for this month amounting to \$68,875.

OVERMAN MINING COMPANY.—The ore product in May was 1200 tons, yielding \$1800 in bullion, or less than \$7 per ton. The ore carries more than the usual amount in gold, but the grade is too low to cover the cost of production. The prospect of developing higher grades is considered favorable, as there is a large body stripped in the mine, and there is said to have recently been an improvement in the grade.

SAVAGE MINING COMPANY.—The official report for the week ended the 18th inst. shows that on the 400-foot level we are stopping ore from the north and south drifts. On the 500 foot level the south drift is now advanced 35 feet and continues in ore of good quality. Car samples average \$33 per ton. From between the 400 and the 900-foot levels we are extracting about 80 tons of ore per day, which is being reduced at the Rock Point mill. There is bullion on hand and previously shipped this month amounting to \$16,000.

NORTH CAROLINA. CLEVELAND COUNTY.

From a letter to the Charlotte Chronicle we take the following:

The shaft on the tin mine at King's Mountain is now 60 feet deep. The ore crops out on the surface at this shaft, and some of the ore which is being taken from the shaft yields about 1½ per cent. This second shaft is 37 feet deep, and the ore which was being taken out yields about ¼ per cent of tin. It will not pay to work this. At a small stream the washing process is being carried on. So far this is only a mere experiment, but car loads of earth are being hauled there, where it is washed out on nearly the same principles as gold washing. An engine has been purchased for crushing, consequently the greatest care is being taken to ascertain whether it will pay to operate the tin ore of King's Mountain.

OHIO.

CONSOLIDATION COAL COMPANY.—This company is operating its large mine at Brashears steadily, employing over 200 men. This mine is on Snow Fork branch, about a half mile above Jobe.

ELLSWORTH & MORRIS COAL COMPANY. This company is now operating one of the largest and most complete coal mining plants in the Hocking Valley, at Jobe, three miles from Buchtel. During the spring extensive improvements were made about the works. A large new tippie was built a hundred yards below the old tippie, high trestling from the old tippie in a straight line from the mouth of both the East and West side mines, into both of which the wire haulage system is in operation. While these works are comparatively new, they made the best record last week of loading coal ever made in the valley over one tippie. One hundred and twelve railroad cars were loaded and shipped in nine hours and a half, making a total of over 2000 tons of marketable coal. It is proposed in a short time to exceed this figure. The company has abundance of orders keeping both the No. 2, or West mine, and the No. 3, or East mine, running steadily. The company now has about 400 men on its pay-rolls.

ATHENS COUNTY.

NELSONVILLE COAL AND COKE COMPANY.—This company is operating its Happy Hollow mine, one mile from Buchtel, under the general supervision of Mr. L. Powell. This mine is opened into the No. 7, or upper coal seam, from which a very good quality of domestic coke is made. There are 26 bee-hive coke-ovens, 17 of which are in blast. The screenings are crushed and washed and run into the ovens. This mine has been having a pretty steady run the past month, loading 12 to 14 cars of lump coal every day.

OREGON.

The Union Pacific Railroad has given rates on ores which secure the Wood River ores to the Portland Reduction Works, Portland, Oregon.

BAKER COUNTY.

St. Louis parties have purchased the Eureka and Excelsior claims, which are on either side of a gulch, and are each 1500 feet in length. A tunnel has been run for some distance in each claim, and both are said to be in ore all the way. Sufficient ore is already on the dump to net several thousand dollars. Mr. C. M.

Donaldson, manager of the Small Hopes Consolidated Mining Company, of Colorado, will be sent out to look after the new bonanza. A company will be formed shortly, and will be known as the "Oregon Mining Company." The property's only drawback is its location, which is in an almost unknown territory, and cut off at present from any railroad. A road is expected, however, to be built within a few miles of it soon. The company will put up a 100-stamp mill, and the water supply being ample and continuous, no trouble is anticipated.

CRACKER CREEK.—This mine, situated about thirty-five miles from Baker City, has been sold to St. Louis parties. A railway has been projected to within seven miles of the claim. The property consists of the two claims lying on each side of a canyon about 1000 feet deep, Cracker Creek flowing through it. The claims run 1500 feet on each side. Tunnels have been run on each side of the creek disclosing high-grade ore. The new owners will push work vigorously and erect a mill.

MULTNOMAH COUNTY.
PORTLAND REDUCTION WORKS.—This company has made its third shipment by the steamer to San Francisco of 208,000 pounds of bullion. The reduction works have been running since May 8th, and the output has been from 12,000 to 18,000 pounds per day. Ore is pouring in quite rapidly now. Ten car-loads are in the yard, twelve car-loads of dry ore are on the way to Portland from Salt Lake City, and 200 tons of Stenwinder ore is coming in from Cœur d'Alene.

PENNSYLVANIA.
COAL.
Carnegie Brothers & Co. are about to erect 150 new coke-ovens at Suterville, along the line of the Baltimore & Ohio, in Westmoreland County.

H. C. FRICK COKE COMPANY.—This company has let the contract for 100 new coke-ovens at Maysville, on the Peemickiey opposite Broad Ford.

PHILADELPHIA & READING COAL AND IRON COMPANY.—The report of this company for May shows that the profits were \$91,383.

NATURAL GAS.
BRIDGEWATER GAS COMPANY.—The company has just turned into its lines two of the Economite wells, and has such an abundance of gas that it will anchor in three other good wells until needed. The company now controls all the Economite territory in both Allegheny and Beaver counties.

PINE RUN GAS COMPANY.—The treasurer's report presented at the annual meeting held at Pittsburg last week, shows: Gross amount of investment, covering 5000 acres of excellent gas lands, including 8 gas wells, 25 miles of pipe lines, rights of way, charter, franchises, etc., in value \$392,202.29. The authorized capital is \$500,000, of which \$339,345 has been issued, leaving \$160,655 in the treasury for extension of lines. The net indebtedness to-day is \$35,773.83, with the June earnings not included, which makes the debt on July 1st nominally \$30,000. The company has an abundance of gas and a growing consumption. The very large well struck some two weeks ago is shut in, as there is a sufficient supply without it. The following officers were elected: President, E. M. Hukill; Treasurer, George P. Hukill, and Secretary, George R. Stewart.

OH.
Exports of refined, crude, and naphtha from the following ports, from January 1st to June 23d.

	1888. Gallons.	1887. Gallons.
From Boston	1,474,772	2,268,580
Philadelphia	52,817,565	70,751,514
Baltimore	2,279,939	3,917,389
Perth Amboy	10,941,866	8,272,163
New York	161,664,885	173,560,588
Total exports	229,179,128	258,768,234

UTAH.
DICKERT & MEYERS SULPHUR COMPANY.—We are informed, says the *New York Oil, Paint and Drug Reporter*, that this company will soon figure in important suits to be entered in the Western courts, and the internal dissensions promise interesting developments. They are based on the allegation that Mr. Daniel Meyers, of the Cleveland drug firm of Benton, Meyers & Co., after selling stock in the sulphur company to his friends, is endeavoring to dispossess the company of its mining property in Utah, to satisfy certain claims which he is said to have against it. Mr. Myers has issued a lengthy circular of explanation, detailing in very plain language how the troubles originated. He accuses Mr. Ferd. Dickert, the secretary, with gross neglect of duty, general incompetency, wilfully violating three solemn agreements, and with gross ingratitude. Mr. Myers claims that he is a victim of misplaced confidence to the tune of \$30,000, but is encouraged by the assurance of a friend that a person can never become a safe, sound business man until he has experienced a "ripping, roaring lawsuit." He makes a proposition to Mr. Dickert to the effect that if he agrees to meet the stockholders in New York, where the majority reside, he (Myers) will pay his transportation and that of all the investors, provided he agrees to be controlled by the conclusions arrived at after a conference, in which event all legal proceedings will be withdrawn. The latter has reference to the suit by the Utah Mining and Manufacturing Company, of Cleveland, against the Dickert & Meyers Company, for possession of the large mine now being worked by the latter. Mr. Myers promises his friends who have stock in the company that he will protect them if the Cleveland concern is successful in its suit. Although Messrs. C. F. G. Meyer, of St. Louis, and H. C. Parke, of Cincinnati, are directors, it would seem that their advice was never taken into consideration by Mr. Dickert, who, with the assistance of his father-in-law, ruled affairs

with an iron hand, it is alleged, and whom Mr. Myers has named the "Dictator." The company has just levied an assessment of \$2.50 per share.

BEAVER COUNTY.
Quite a revival in copper is now going on in Beaver County, says a correspondent of the *Salt Lake Tribune*. Prof. Sebillott, of France, representing the interests of the French Copper Company, operating mines in San Francisco district, is at Milford, looking up the copper deposits of Beaver County. The copper ores in San Francisco district are mostly sulphurets, while in Beaver, Star, Lake and Rocky districts, they are oxides associated with iron and lime, and would work well with the San Francisco ores such as the Cactus, Comet and Globe mines, which show large bodies of pyrites or sulphurets of copper. Lake Superior and Ariel, of Star district, the O. K., of Beaver Lake district, the Red Bird, Old Hickory, Severance and a number of other claims of Rocky district all carry and show large bodies of carbonates and oxides of copper ores which, if worked, would no doubt develop better ores. The latter claims are within half a mile of the Utah Central Railway track. At Milford there is a good concentrating mill, also a good smelter to matte the copper, which are convenient to these mines.

The French company have put a few men at work on its claims in Copper Gulch, San Francisco district.

SUMMIT COUNTY.
DALY MINING COMPANY.—Nearly 200 men are employed at the mine developing and prospecting the ledge, and about 100 tons are shipped daily.

ONTARIO SILVER MINING COMPANY.—Work on the contemplated drain tunnel, which will tap the mine at the depth of 1600 feet, it is stated will commence next month.

PIONEER.—Ore has been found in the old Pioneer patented ground farther west than any point where it has been opened before. The ore is said to go over three hundred ounces to the ton in silver, and 40 per cent lead. This find, it is stated, proves that the vein runs with the ridge and dips to the northwest, instead of crossing the ridge, as was formerly supposed. This ridge (the Pioneer) is now supposed to hold the Ontario and Daly veins through its entire length to Cottonwood.

VERMONT.
The prospect of Vermont becoming a producer of manganese is very favorable.

BENNINGTON COUNTY.
A correspondent sends us the following: A test-hole drilled on the property held by R. P. Hoyt at East Dorset passed through a body of ore 40 feet thick. Samples taken from the central part of the deposit, about 70 feet from the surface, assayed: Manganese, 4.5 per cent; iron, 12.65; phosphorus, 0.29 per cent. A company will be organized to work these deposits, which are very favorably located. The ore occurs in a bed dipping at an angle of 50 degrees to the east, enclosed in conformable stratas of ochre clay, sand, etc.

ORANGE COUNTY.
ELIZABETH MINING COMPANY.—We are officially informed that there has been a continued improvement in the quality of the ore since getting further into it, and the quantity appears inexhaustible. A large force is not being worked, but the water jacket furnace is in blast, producing excellent results. Owing to the illness of the company's chemist, Mr. Glenn, definite results can not be given, but the work of the last few months has more than justified the best Mr. H. M. Howe could predict when there, some two years ago.

RUTLAND COUNTY.
The mine at South Wallingford still continues to make steady shipments of ore to Carnegie's works. The ore is said to assay: Manganese, 28 per cent; iron, 22 per cent; phosphorus, 0.2 per cent. An adit, 800 feet long, is being run to strike the deposit about 60 feet below the present workings.

WASHINGTON TERRITORY.
Seattle, known in the west as the "Queen City of Puget Sound," is enjoying a first-class boom. For years the great Northern Pacific Railroad has persistently refused to grant this city a railroad connection. But its attempts to thus divert the stream of commercial wealth to other points was foiled by the organization of the Seattle, Lake Shore & Eastern Railway, which is being pushed from Seattle eastward to Spokane Falls and other points in the Columbia River basin.

Another important enterprise is the Seattle Coal and Iron Company, a concern composed principally of New York and Providence, R. I., capitalists. Its property comprises 1497 acres, through which veins of coal run for a distance of two miles. The veins are five in number, being respectively five, six, seven, six and twelve feet in thickness. They are of regular formation, with a dip of from 47 to 37°.

There is still another cause for a belief in Seattle's future greatness. The Moss Bay Hematite Iron Ore Company, of Cumberland, England, has decided to erect, as already reported in previous issues of the *ENGINEERING AND MINING JOURNAL*, Bessemer steel works on the shores of Lake Washington, near Seattle. These works are to be the most extensive west of Pittsburg and will give employment to a large number of men. The Seattle, Lake Shore & Eastern Railway will connect directly with the works.

PIERCE COUNTY.
TACOMA COAL AND COKE COMPANY.—Reports dated the 13th inst. state that serious trouble has occurred among the miners at the works of this company at Wilkeson, twenty-five miles from Tacoma, resulting in the shutting down of the mines and coke-ovens. Large orders from Frisco remain unfilled. More trouble is feared, which may cause serious damage to the company and its customers.

WISCONSIN.

GOGBEC DISTRICT.

The trustees of the Nimikon, Kakagou and Bessemer mines have issued circulars informing the bondholders that the stockholders would not advance any more money for working the mines. The following statement shows the financial condition of the mines:

Unpaid liabilities \$28,190.11	Bonds authorized \$75,000.00
Bonds sold	Bonds unsold .. 31,000.00
Total	Bessemer.
\$95,390.11	Unpaid liabilities \$19,009.60
Bonds authorized \$0,000.00	Bonds sold
Bonds unsold	Total
12,800.00	\$44,009.60
Kakagou.	Bonds authorized. 60,000.00
Unpaid liabilities \$27,625.05	Unsold bonds
Bonds sold	35,000.00
44,000.00	
Total	\$71,625.05

The semi-annual interest on the outstanding bond of the mines June 1st was \$6500, making the total indebtedness of the three mines, including total liabilities to May 1st, \$217,524.78.

From a circular issued by Mr. A. M. Helmer, of Milwaukee, in reference to the mines of the Gogebic District, we take the following: "The latest feature in mining circles is the appointment of a receiver for the Nimikon, Kakagou and Bessemer mines, on the Gogebic Range. The issue of the bonds on these properties did not save the stock, as anticipated, and the properties are held now in the hands of a receiver, and will be foreclosed. Default has been made on the interest and application made to the court for foreclosure on the mortgage and to sell the property. This will result in wiping out the stock, as the stockholders are liable for six months' labor. There is a desire to get rid of the stock, and sales have been made at 5c. a share.

The Sunday Lake mine is in possession of the Fee owners, and the stock is apparently valueless, though sales have been made at from 3c. to 5c. per share.

Although the mining interests generally are greatly depressed, there is some trading in such stock as the Aurora, Brotherton, Germania, Ironton, Montreal, Nimikon, Odanah, Pence, Superior, United I. & L. Syndicate, etc. At a recent sheriff's sale Brotherton sold at \$1, Vermillion at 40c., and Northwestern at 20c."

The Germania, Pence, Father Hennepin, Superior, and Iron Prince are the only mines west of the river where shipments are going forward or any considerable amount of development work is being done. The local papers state that there is no denying the fact that the outlook for the season, at least for the west part of the range, continues to grow dark, and is having the effect to paralyze local business of all kinds.

WYOMING.
WYOMING MIDLAND RAILROAD COMPANY.—This company has been organized, with a capital stock of \$5,000,000, shares \$100 each, to construct and operate a railroad from a point near the junction of the northern boundary line of Wyoming Territory and Clark's Fork River, thence southeast to Big Horn River, near the mouth of Grey Bull River; then up the valley of Big Horn River to south fork of Owl Creek; then following the Big Horn Valley through the Wind River or Shoshone Reservation, a distance of 78 miles, to south boundary line of Shoshone Reservation; thence to Lander, at Big Horn River, a total distance of 200 miles. The trustees are Nelson W. Brewster, Theo. Franklyn, Jacob Hitchcock, Douglas Smyth, and Chas. F. Roberts, all of New York City. The home office of the company will be in New York, with a branch office in Lander, Wyoming. Northern Pacific men are at the head of the enterprise. The route described will take the road to the west of the Big Horn range, through a comparatively new and unsettled country, rich in agricultural, timber, and grazing lands, and oil and mineral deposits.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 29.

Statistics.
Production Bituminous Coal for week ended June 23d, and year from January 1st:

	EASTERN AND NORTHERN SHIPMENTS.	
	1888.	1887.
Phila. & Erie RR.....	4,875	32,340
*Cumberland, Md.....	61,448	1,650,814
Baltim. Pa.....	2,484	86,266
Broad Top, Pa.....		172,494
H. & Broad Top, RR.....		172,080
Clearfield Region, Pa.....		63,269
Snow Shoe.....	2,260	83,132
Karlsruhe (Keating).....	2,949	94,176
Tyrone & Clearfield.....	60,906	1,654,039
Tipton.....	1,532	29,452
Allegheny Region, Pa.....		4,165
Gallitzin & Mountain.....	10,146	431,619
Poconong Flat Top Coal.....		527,624
Norfolk & West, RR.....	25,628	759,565
Kanawha Region, W. Va.....		567,131
Ches. & Ohio RR.....		858,113
		725,008
Total.....	175,248	5,809,043
* Tons of 2240 lbs.		5,189,397

	WESTERN SHIPMENTS.	
	1888.	1887.
Pittsburg Region, Pa.....	7,233	190,261
West Penn RR.....	2,019	49,293
Southwest Penn. RR.....	3,148	65,166
Pennsylvania RR.....		144,627
Westmoreland Region, Pa.....		105,433
Pennsylvania RR.....		840,989
Monongahela Region, Pa.....		713,896
Pennsylvania RR.....	11,671	190,468
		194,305
Total.....	55,859	1,415,634
Grand total.....	231,107	7,224,681
		6,421,710

Production of Coke on line of Pennsylvania RR—fort week ending June 23d, and year from January 1st, in

cons of 2000 pounds: Week, 62,682 tons; year, 1,858,432 tons; to corresponding date in 1887, 1,618,414 tons

Production Anthracite Coal for week ended June 23 and year from January 1st:

Tons of 2240 lbs.	1888.		1887.
	Week.	Year.	Year.
P. & Read RR. Co.	127,328	2,561,838	3,691,129
Cent. R. R. of N. J.	123,035	2,409,453	2,343,059
L. V. RR. Co.	135,000	2,826,061	3,422,087
D., L. & W. RR. Co.	115,602	2,969,561	2,491,574
D. & H. Canal Co.	70,452	1,980,921	1,769,179
Penna. RR.	71,357	1,843,310	1,460,470
Penna. Coal Co.	35,889	707,668	657,896
Penna. Canal Co.	11,098	148,807	121,489
Tota	680,761	15,497,519	15,956,883
Decrease	7,102	459,364	
Increase			

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1883	14,128,289	1885	12,754,639
1884	13,628,406	1886	14,206,165

Anthracite.

The anthracite trade is better than for some time past, due doubtless to the expectation of an advance in prices in July.

On the 27th inst. the presidents of the several coal companies had a meeting, when the condition of business was talked over and it was decided that 2,750,000 tons of coal was about the amount of coal that could be conveniently handled in July, and of course it is understood that each company will produce its proportion of this according to the quota which obtained when there was a combination. Unfortunately a few of the companies, and especially the Lackawanna & Western, mines away without much regard for the "understanding among gentlemen," (some of those interested express it in less polite language), and overproduces its quota every month regularly.

In July, 1887, the quota was 2,600,000 tons, and there was actually produced about 2,800,000 tons; but last year was an exceptionally good one in every branch of trade. It is doubtful if the market will require 2 1/2 million tons, plus the assured overproduction in July this year.

The Western Association decided to advance the prices of anthracite 25 cents a ton all round to interior Western points, on the 1st July; and the sales agents, who met on the 28th, informally suggested the following advance on Eastern coal, to go into effect on the 15th July:

On Broken	10c. advance to \$3.85 per long ton
Egg	15c. " " 4.15 " "
Stove and Chestnut	25c. " " 4.50 " "

Pea coal is not regulated and is selling at all kinds of low prices, \$2.25 per ton being openly asked and "no reasonable offer refused," while buckwheat coal sells from \$1.85 per ton up. The shadow of the proposed advance on the 15th has stimulated the demand and business is lively and will so continue until the 15th inst.

Some of the sales agents think that the market will stand another and similar advance about September 1st.

It is needless to say that the railroads will promptly appropriate the greater part, and perhaps all of the advance in the price of coal.

The freights are already far too high, and should be lowered, not advanced. Then consumers would get cheap coal while the mines could make a fair profit. Now the railroads take it all.

Mr. Holden, General Sales Agent of the Lackawanna & Western Company, is reported in a daily paper to have said: "Compared with 1886, there is an improvement in the coal trade of 25 per cent, and betterment compared with 1887 of 10 per cent. Indications are that the fall will be more prosperous than the spring trade was."

Furnace Lehigh lump coal is selling at \$2.10 on the cars at the mine, and railroad tolls to the Lehigh furnaces are 60 cents, making coal at the furnace \$2.70 per gross ton, which certainly cannot be considered a high price.

Bituminous.

There is nothing new to report. Coal is abundant, and prices are maintained, except where a large contract is in view, when there appears to be little hesitation in shading them. Production continues larger in each of the districts than during the same period in 1887.

Thus the Cumberland is about 154,000 tons ahead of last year. The Clearfield, 25,000 tons ahead; Pocahontas, 185,000 tons ahead; Birch Creek, 242,000 tons ahead; Chesapeake & Ohio, 135,000 tons ahead, and Broadtop, 2000 tons ahead, or altogether have produced this year about 5,857,000 tons, as against 5,115,000 tons in the corresponding period in 1887; yet last year gave far the largest output the trade ever saw.

If the consumption of coal is the best measure of the industrial capacity of a country, then business, so far as production and consumption go, is excellent throughout the country, and though prices of some articles are low, business is fairly remunerative all round. We will not have any very bad business this year, even if it be "a presidential year."

Boston. June 28.

[From our Special Correspondent.]

The demand for anthracite coal continues to be rather lighter than usual for the season of the year. The talk of an advance has not materialized, although

July 1st is right upon us, and now it is stated that about the middle of July prices may start. This is not assented with any very great amount of confidence, however. A drawback to the life and tone of the market is the slowness with which the old orders are filled, there having been very little improvement in this direction. F.o.b quotations remain quite steady.

In the line of bituminous coal there is not a ripple. Apparently all the big business is gathered in.

In freights an easier tone is noticeable, for there seems to be more vessels at the lower ports, particularly at Philadelphia, and there are more coal barges at shipping points. If this continues business will be more brisk, but it is very unsafe to prophesy on freights this year.

We quote vessel rates, exclusive of discharging: New York, 80@85c.; Philadelphia, \$1@1.05; Baltimore, \$1.10@1.15; Newport News and Norfolk, \$1.05@1.10; Richmond, \$1.15@1.25.

The demand at retail is better than it was, and prices are maintained. This may have a good effect upon the jobbing market of this port.

Retail quotations, 2000 pounds to the ton, delivered, are as follows: Stove, \$6; Egg, \$5.75; Broken, \$5.50; Nut, \$6; Franklin, \$7.25; Lehigh Egg, \$6; Broken, \$5.75; Bituminous (on the wharf), \$4.25.

The new Coal Exchange continues to be an object of great interest here, and it now has about 100 members, of whom 75 are local retailers and the rest out of town dealers and Boston wholesalers. The Exchange has a long distance telephone to New York, Philadelphia and other points for the use of members.

Buffalo. June 28.

[From our Special Correspondent.]

The trade say that the anthracite coal business is in good shape and the result of the first half of the year's trade quite satisfactory. Whether there will be an advance in prices July 2d depends upon the action of the Western Committee, which meets to-day, in New York. The Buffalo Water-Works Commission have awarded the contract for 10,000 tons of anthracite grate coal to Mr. E. L. Hedstrom, at his bid of \$3.87 per ton. It was ascertained that the changing from hard coal to soft coal would cost too much money, hence the result as stated.

The bituminous coal trade continues "stale, flat and unprofitable." A retailer just said, "I can assure you that sales have been made during the last ten days which netted a profit to the seller of only five cents per ton and the wholesaler's margin was nothing!" How is that for "buying and selling and getting a living by the loss," as the old chestnut had it recorded?

The bids for supplying hard coals for our city schools were seventeen in number—and of an astonishing character when the superintendent opened them. They disclosed a uniform rate of \$4.50 for grate and \$4.75 for stove and chestnut per 2000 pounds delivered, and to each bid was added a postscript ("on and after July 1st thirty-five cents per ton will be added.") What do you think of bids like these? It shows well for the cohesiveness of the local retail dealers and that the wholesalers are equally firm in enforcing their terms of supplying the said retailers. On Monday last the Common Council authorized the contract (3500 tons), to be awarded to Mr. James Hauraban at the prices named for all he delivered between July 1st and October 1st, and give him an additional 35c. per ton on all delivered after the latter date. Whether this award will be accepted remains to be seen.

Mr. Thomas C. Pears has become a partner with Mr. Henry E. Smith in the coal trade here; the firm name is Messrs. Henry E. Smith & Co.

There was a good demand for coal vessels with strong feeling among agents; but few craft in port, however, and next to none in sight near by. On Monday and Tuesday very many charters (over 30) were made to arrive at 10 cents advance to Chicago, and 5 cents advance to Milwaukee and Lake Superior ports. The Racine and Bay City rates were 5 cents and Toledo 10 cents higher. Closing quiet and steady. It will take several days to load the tonnage to arrive, hence but few engagements were made to-day.

The shipments by lake westward from June 21st to 27th, both days inclusive, were not heavy for the reasons stated in preceding paragraph,—they aggregated 62,450 net tons, namely: 22,480 to Chicago, 12,190 to Milwaukee, 12,980 to Duluth, 600 to Toledo, 6100 to Superior, 1000 to Green Bay, 600 to Racine, 1730 to Bay City, 1100 to Manitowoc, 650 to Menominee, 600 to Saginaw, 230 to Port Clinton, Ohio, 1045 to Sheboygan, 500 to Port Huron and 680 to Manistee. Total shipments thus far this season (including vessels from Tonawanda not reported at Custom House), about 750,000 net tons. The rates of freight were 90 cents and \$1 to Chicago, 85 and 90 to Milwaukee, 50 cents to Saginaw and Toledo, 70 and 75 cents to Duluth and Lake Superior ports, 85 cents to Green Bay, Sheboygan and Manitowoc, 95 cents to Racine, \$1 to Manistee, 40 cents to Port Huron, 35 and 40 cents to Bay City, and 90 cents to Menominee.

The blockade of coal boats at Milwaukee has assumed very annoying features, but patient waiting will solve the difficulty. One vessel heard from reports waiting just one week for her turn at the dock.

By the bye, it may be well to give the reason for the advance in coal freights. It is the law of equalization. Grain rates down are very low, therefore coal freights up must be high to establish a paying average.

Canal shipments coal for third week in June none; receipts 6710 net tons. The only charters reported were this forenoon of three loads of coal due to Syracuse at 40c. per gross ton free on and off. The nominal rate to New York \$1 and to Albany and Troy 80c. per net ton free on and off.

"Occasional" on the Western Coal Trade.

EDITOR ENGINEERING AND MINING JOURNAL:

Your request for another blast from my horn received. I have been quiet because every thing has been moving along so smoothly, and in such a business-like way, that I have had nobody to "pitch into." My grumbles and snarls at the evil practices in vogue in the business were followed to a great extent by reformation. The growth of the business has been such that legitimate demand has largely done away with the necessity for the forcing process and it looks very much as though the anthracite coal trade of the West was on a good solid foundation at last, and certainly if half way prudence can get a lodgment in the noddles of some of our naturally too belligerent "magnates" we have a long period of prosperity before us in the coal trade. The consumption, even under adverse conditions of the iron and other manufacturing interests, will still be great enough to afford all the transportation lines a handsome business. The "squeezing out" policy having resulted in nothing but loss to the squeezers is not likely to be resorted to. Corporations too are beginning to be chary about the exercise of arbitrary powers, and altogether the outlook is cheerful.

The course of trade this spring was, and at present is, very gratifying to most of us. There was a fortunate wait on the part of both buyers and sellers. Prices dropped to a safer level on account of the delay of the buyers, and were saved from too great a fall by the conservative position of the sellers. There has been, on the whole, a sufficient movement to insure a steady rising market during the remainder of the year.

The committee having the general direction of prices this year has not undertaken to govern the universe as formerly, and consequently is better able to cover its proper position. An advance of 25c. at its meeting this week might be a wise move in view of the position of affairs here.

The position of bituminous coal "bates the devil." Our two soft coal roads have succeeded in reorganizing with another shower of bonds, and as long as the proceeds last we can look for low prices. I am told parties are getting coal here at \$1.55, which costs the parties 70 cents to mine and \$1 freight, the nut and slack and company stores making up the loss. Five cents for a mining profit and 2 1/2 cents as commission is regarded as a "big thing." The coal lands are being rapidly exhausted, and in a few years their present owners will be kicking themselves on account of their shortsightedness.

Pittsburg. June 28.

[From our Special Correspondent.]

Coal.—Trade was steady but very active. The wickets at Davis Island dam being up furnishes a six foot stage of water in the Allegheny and Monongahela at this port. Tow-boats have been busy towing several million bushels from the pools to the lower landings, being ready for shipment the first rise.

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

First pool	\$4.75	Fourth pool	\$3.25
Second pool	4.25	Railroad coal	5.00
Third pool	3.75		

Connellsville Coke.—The situation is without change. Coke is still being sold below cost of production; of course there must be a change, notwithstanding the companies. There is a large falling off in shipments, all the principal furnaces being overstocked. Blast-furnace, \$1 f.o.b. at works; foundries, \$1.15 per ton.

FREIGHTS.

The latest actual charters to June 28th, per ton [of 2240 lbs.:

From New York to:—Bath, Me., 80@90; Beverly, 90; Boston, 80; Bridgeport, Conn., 55; Cambridge, Mass., 80; Cambridge, 80; Chelsea, 80; Com. Pt., Mass., 80; E. Boston, 80; E. Cambridge, 80; E. Greenwich, R. I., 75; Fall River, 75; New Bedford, 80; Newburyport, 95; New Haven, 55; Newport, 75; New London, 70; Norwalk, Conn., 55; Portsmouth, N. H., 80; Providence, 75; Salem, 80.

From Baltimore to:—Banzor, Me., 1.10; Bath, 1.10; Boston, 1.10; Bridgeport, Conn., 90; Charleston, 70; Fall River, 90; Galveston, 2.90@3.00; New Bedford, 90; Newburyport, 1.30; New Haven, 90; New London, 90; New York, 85; Portland, 1.05; Portsmouth, N. H., 1.10; Providence, 90; Richmond, Va., 60; Salem, Mass., 1.05; Savannah, 90@1.00; Williamsburg, N. Y., 85@95.

From Philadelphia to:—Alexandria, 85; Annapolis, 65; Bangor, 95; Bath, Me., 1.00; Beverly, 1.05; Boston, 90@1.00; Charlestown, 75; Com. Point, Mass., 1.00@1.05; Fall River, 80@90; Gardner, Me., 1.05; Gloucester, 1.00@1.05; Lynn, 1.10@1.30; Marblehead, 1.10; Milton, 1.20; New Bedford, 80@90; Newburyport, 1.15@1.25; New Haven, 80; New York, 90; Norfolk, 60; Portland, 90; Portsmouth, N. H., 1.00; Providence, 80@90; Richmond, Va., 75; Saco, Me., 1.20; Salem, Mass., 1.05; Sangus, 1.15; Savannah, 85@95; Washington, 85; Wilmington, N. C., 80.

* And discharging, 3c. per bridge extra. † Alongside. ‡ And towing.

MARKETS.

NEW YORK, Friday Evening, June 29.
Prices of Silver per ounce troy.

J'ne	Sterling exchange	London Pence.	N. Y. Cents.	J'ne	Sterling exchange	London Pence.	N. Y. Cts.
25	4.88	42 1-16	92	27	4.88	42 3-16	92 1/4
26	4.88	42 1/4	92 1/4	28	4.88	42 1/4	92 3/4
28	4.88	42 3-16	92 3/4	29	4.88	42 1/4	*

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in its rate for discount, and it remains at 2½ per cent. During the week the bank gained £511,000, and the proportion of its reserve to its liabilities was raised from 42.75 to 43.26 per cent, against a reduction from 47.52 to 45 per cent in the same week of last year, when its rate for discount was 2 per cent. Thursday the bank gained £18,000 bullion on balance. The weekly statement of the Bank of France shows a gain of 925,000 francs gold and a gain of 4,325,000 francs silver.

Copper.—The past week has been a very quiet and uninteresting one in the copper market, but a strong undertone continues to be observable, and the quotations for Lake descriptions are rather higher, both for spot and future deliveries. It is daily becoming more and more evident that the quantity of Lake Copper remaining under the control of people independent of the syndicate is becoming exceedingly limited. Our present quotations for Lake Copper are: Spot, 16.55; July, 16.55; August, 16.40; September, 16.35; October, 16.35; November, 16.25; December, 16.15. The actual transactions during the week have been very unimportant. Outside brands are neglected, and good casting copper can now be bought at 15 to 15½, which is a very large difference when compared with the Lake brands; but even at these prices it is rather difficult to effect sales.

Cable advices from London report Chili Bars this morning at £90 17s. 6d. Spot, and £78 to £78 5s. for three months futures, which is a decline of about £1 for the week. The official quotation for Best Selected has been reduced to £78, but orders can be placed under this price in the open market. It is also understood that pretty large quantities of Chili bars have been transferred from Liverpool and Swansea to private warehouses in Havre and Rouen, the evident object being to make it appear as if these bars had been delivered for actual consumption; but it need hardly be pointed out that the present level of Chili bar prices is much too high to tempt consumers to make purchases, and in addition to these considerations furnace material is now offered somewhat lower.

The French copper syndicate is reported to have bought for three years the output of two of the leading copper mines in Japan, amounting to seven eighths of the total Japanese output.

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

To	Copper matte.	Lbs.	Value
By S. S. City of Berlin	Casks	80	116,000
By S. S. Spin	Sacks	4,906	580,000
To Rotterdam	Copper		
By S. S. Rotterdam	Casks	180	225,000
To Liverpool			
By S. S. Chester	Bbls.	88	112,000
To Antwerp			
By S. S. Jane Brydel	Bars	491	146,587
	Cakes	73	10,680
To Havre			
By S. S. Bourgogne	Casks	670	275,100
	Bars	366	74,684
To Hamburg	Old Copper		In transi.
By S. S. Ruzia	Pks.	23	2,875
To Hamburg	Old brass		3,990
By S. S. Ruzia	Pks.	14	4,849

Tin has experienced another sharp drop, and it seems quite clear that some parties in London are still hammering the market down, their ultimate object being at present rather difficult to fathom. From information received by us it appears very probably that shipments from the east will fall off considerably in the next few months, as the producers are rather reluctant to sell at present prices. This afternoon the market closes with a firmer tone. We quote Spot, 17½; June, 17½; July, 17.20; August, 17.30. In London Spot tin yesterday touched £74 15s., but the market closed a little firmer to-day at £75 1s. to £75 2s. 6d. Spot, and £75 5s. to £75 10s. for three months forward.

Lead has been knocked about in rather a remarkable manner. The speculative buying continued on Monday and on that day also reached its climate, when heavy purchases were made at 4.17½ for August and 4.20 for September, whilst at the same time Spot lead was comparatively neglected. Next morning, however, to the surprise of the trade, the operators kept entirely out of the market, and thereupon prices very quickly fell down to 3.80 for Spot, 3.85 July and 3.90 August. A reaction then set in and the closing quotations are Spot 3.97½, July 4.05, August 4.10.

It can be readily understood that such rapid fluctuations, besides indicating a very unhealthy condition of affairs, has also the effect of keeping consumers more than ever on their guard, and as a consequence, they only buy with the greatest caution.

The English markets remain very dull, and private cable advices quote Spanish lead at £12 2s. 6d., and English at £12 7s. 6d.

Messrs. John Wahl & Co., of St. Louis, telegraph to-day as follows:

A dull and easier feeling has prevailed since we last reported. The market is depressed, owing to the unsettled seaboard market. Our buyers here do not want lead at sellers' figures, which are for Refined 3.80, and for Common 3.75.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows: Market opened strong. Sales of desilverized were made at 4, but under weak market advices from New York prices have declined to 4.55@4.60.

Spelter.—This article continues in the same state as previously reported and quotations are unchanged. Domestic is 4¼@4.60, and Foreign 5½@5.20. The German markets are declining.

Antimony unaltered. Cookson's, 13½c.; Hallett's, 10c.

Chemicals.—There are few changes to record in the chemical line since our last writing. The volume of business considering the season is fair, though the old complaint of "jobbing sales" continues. Carbonated soda ash, 48 per cent, is very quiet, with little on the spot. Quotations for spot lots continue at 1.25 and 1.30, according to quantity, etc. Future delivery is quoted at 1.22½ and 1.25 without attracting buyers. High test continues dull, with no change in quotations.

Caustic soda ash, 48 per cent, is still without much animation. The stock on the spot continues very light, and holders realize 1.30@1.35 for small lots ex store. Futures are attracting some little attention, and we quote 1.22@1.25, according to quantity and seller.

Caustic soda continues dull and depressed, the spot stock is small and most sales are of a jobbing character to supply consumers immediate wants. We continue to quote 60 per cent 2.35 for futures, 2.40@2.50 spot, 70 per cent and 74 per cent 2.20@2.22½.

English sal soda is in moderate demand, and small quantities are offering on the spot at 1c. Futures are without change in condition or prices, which are steady, at 95@97½c. American sal soda is moderately active, and firmly held at prices agreed upon by the manufacturers.

Bleaching powder is without change since our last writing. The market is almost bare of stock, and no concessions are made from former prices, despite the lack of business. Boston takes what business is doing in the bleaching powder line, the price in that city ranging from 1.75@1.80c. New York prices are held at 1.85@1.95c., according to brand, quantity, etc.

The acid market is in the same condition as last week.

Sulphuric acid, 66 degrees, is moving fairly, in accordance with consumers' wants, and the prices are well maintained at 90@95c. for large lots, \$1@1.10 for smaller quantities.

Acetic acid has been fairly active during the week, though dealers generally complain of small sales. We continue to quote 2¼@2½, as to quantity, etc.

Nitric and muriatic acids have been doing fairly well, with no change in list prices.

Oxalic acid continues weak and unsettled, and the volume of business done is small. Consumers prefer supplying their wants as they occur, hoping for a further lowering of the price before laying in any stock or giving contracts. We continue to quote 6½c. for large lots, and 7c. for smaller quantities.

The fertilizing chemical market during the past week has been fairly active, though business cannot be called rushing. Dealers are beginning to make contracts for future delivery, though it is as yet rather early. We quote the principal chemicals and fertilizing materials as follows: Dried blood (city), low grade, 2.20@2.25 per unit; high grade, 2.35@2.40 per unit; tannage, high grade, \$24@25 per ton, low grade, \$18@21, as to quality; Azotin, 2.20 per unit. Fish scrap, f.o.b. factory, \$24@25 per ton. Sulphate of ammonia, 3.15@3.20 per cwt. Steamed bones, \$20@22 per ton. Dried Charleston rock is worth \$6 per ton f.o.b. at mines, and undried \$1 per ton less. Refuse bone-black is \$18 per ton, guaranteed over 70 per cent. bone phosphate. Dissolved bone-black is 90c. per unit for available phosphoric acid and acid phosphate; 75c. per unit for available phosphoric acid.

High grade sulphate of potash is firm at 2.10c. on basis of 90 per cent.

Double manure salt is rather dull, but the market is firm, and prices are maintained at 1.05.

Muriate of potash is fairly active at our former figures of 1.75 sail shipment, 1.77½@1.80 for prompt delivery and 1.80 on the spot.

Kainit is very firm, with nothing offering on the spot. For prompt delivery and shipment \$9@9.50 is the quoted price.

Brimstone is very firm on the spot, \$27 per ton being asked for small lots ex store. This price is above consumers' views, and very little business is done in spot goods. However, as the spot stock is very light, holders are unwilling to concede anything. Stocks afloat due within ten days are selling at \$23 per ton, and futures are offering at \$20 per ton. The sales for the past week aggregate some 5000 tons.

Nitrate of soda is quiet, and stock is procurable ex store at \$2.05 in a large way, \$2.10 for small lots. Some 50,000 bags are on the way, all for consumption.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 29.

The general condition of the iron market remains about the same as that reported for several weeks past. There has been very little actual new business, but we hear from several sources that there has been a perceptible increase in the inquiry for pig-iron of all grades, foundry, forge, and charcoal irons.

Prices are, however, unchanged, and there is very little likelihood of any change at present. American irons are perhaps a little firmer at current quotations. Sellers of Southern irons report that there is a good demand at current rates for all the foundry iron that they can get for early delivery, and in most cases the Southern turnaces have sold their product well ahead.

The Thomas Iron Company report new sales this week of 2000 tons, with a better demand.

Scotch irons remain very dull, and prices are weak in this market, although a little higher in Glasgow than last week.

A sale is reported of 10,000 tons of domestic Bessemer pig, on private terms. Otherwise this brand has been dull and weak.

Spiegeleisen is unchanged, ranging from \$26 and \$27 for English. An American company has bought recently 5000 tons.

Wire rods are rather more active, but no new transactions of moment are reported. Prices range from \$40@41 asked, according to time of delivery, the highest price being asked for early delivery.

Steel rails are weaker, with \$30 at Eastern mills being generally quoted, and it is believed that even this price would be shaded. A sale of 10,000 tons has been made to a Southern road.

Several of the mills will close for repairs in July. The sales for this year's delivery will aggregate over 880,000 tons.

The demand for structural iron is dull, except for the elevated roads now building in several cities. The bridge building industry is somewhat depressed, owing to the decline in railroad building.

There is very little doing in old materials. Scrap iron is lifeless. Beyond a sale of 1000 tons tee rails at \$20.50, Jersey City, no transactions are reported in old rails. Tees are offered at \$20, and do not find ready sale even at that figure.

President B. G. Clarke, of the Thomas Iron Company, is reported to have said on Wednesday that within five years rails of from 80 to 100 pounds will be used exclusively. The Pennsylvania Railroad is now laying 82-pound rails.

Louisville, June 26.

[Reported by HALL BROTHERS & Co.]

The market is still, as last reported, in a very unsettled condition. Some sales are reported to have been made at an actual loss by some furnaces that were obliged to realize on their product as made. Some predict that prices are as low as they will go, while others think that the bottom has not yet been touched. Large orders at very low prices have been declined by some furnaces, but accepted by others. The volume of business during the past week has been large, mainly for early shipments, although some extended delivery contracts have been accepted. It seems apparent now that a strike, to take effect about July 1, can scarcely be avoided, or at least a general shut down for six weeks or more will probably be agreed upon. Bessemer irons have shown some signs of improvement, but other metals have not sympathized with this class of iron.

Quotations for cash f.o.b. Louisville, will be found in the weekly register of prices.

Philadelphia, June 29.

[From our Special Correspondent.]

Large consumers of choice brands of foundry iron have shown some anxiety to secure 30 to 60 days' supplies, and a simultaneous effort in that direction has helped to give the market an appearance of firmness, though it does not extend to the poorer brands. There is more variation in quotations on this account, the anxiety to dispose of inferior brands leading to further shading, but without decided success. Buyers are inclined to delay wherever they can. The result is that, with a few exceptions at each end of the list, crude irons are where they have been for several weeks. No one has sold spiegel or English Bessemer. Quite a steady demand keeps up for blooms, and prices are firm. A few makers have accumulated business in muck bars. Bar mills have been making less iron on account of the heat, and with quite a number this week ends the half year. The suspension will be from two or three weeks. Prices unchanged. Buyers are indifferent. The western wages question is watched. Nails are somewhat more active, but considerable capacity is idle. The shipyard people have closed for several good sized lots. Tank iron users have also bought for September delivery. There are parties who have orders for sheet, but are waiting for better inducements. There has been some additional business in all kinds of sheet iron. The structural iron makers report nothing new. Merchant steel quotations are strong. Small pipe are attracting more attention than other kinds. Steel rail orders are rather rare, but a good order drops in every few days at usual quotations. Makers feel somewhat despondent over the situation. Old rails could be promptly sold at concessions of 50 cents to \$1 from quoted rates. Some shadings could be had from quoted rates on scrap iron, but mill men and blooming managers are rather indifferent just now. Prices will be found in our weekly register of prices.

Pittsburg, June 28.

[From our Special Correspondent.]

The activity and improved condition noted in last report seems to have ended with the close of the week. The feeling at that time was favorable for an early adjustment of the labor difficulties, together with the scale being signed and with the smoking of the pipe of peace between the mill owners and the wage workers. Now things present a different appearance. It seems to be floating in the air that a strike is near at hand. The next ten weeks will show what the result will be. There are two scales, one made by the Amalgamated, which the mill owners refuse to sign, the other one by the manufacturers, which the Amalgamated refuse to have anything to do with. It will require the best of management to settle the matter of wages. Taking these matters into consideration, it is not to be wondered at that the demand for raw material has fallen off, and the activity that prevailed last week received a serious check. Many are of the opinion that there will either be a reduction in wages or a suspension of work, but for how long is another matter altogether. Until something is decided upon business can not be other than it is at present.

dull, feverish and irregular. There is at this time a large percentage of men out of employment from one cause and another; unless a settlement of the difficulties is soon reached thousands now at work will be added to the unemployed. Prices of No. 1 iron show but slight changes in values, purchases confined principally to limited amounts. Steel slabs and billets changed hands reasonably freely; prices a shade off. Bessemer prices have been maintained. Nos. 1 and 2 foundry and gray forge descriptions were neglected. Old rails are a drug on the market, with only a limited inquiry for muck bar. The iron outlook is certainly not very promising.

Coal and Coke Smelted Lake Ore.

Table listing prices for 1070 Tons Bessemer, 2500 Tons Bessemer, late delivery, 200 Tons Gray Forge, etc.

Coke, Native Ore.

Table listing prices for 250 Tons Gray Forge, 50 Tons White and Mottled, 25 Tons No 1 Foundry, etc.

Steel Slabs and Billets.

Table listing prices for 1250 Tons Steel Slabs, 1000 Tons Billets, 1000 Tons Nail Slabs, August and September, etc.

Muck Bar.

Table listing prices for 400 Tons Neutral, 200 Tons Neutral.

Old Iron Rails.

Table listing prices for 375 Tons American T's, 200 Tons American T's.

Steel Crop Ends.

Table listing prices for 750 Tons July and August.

Steel Wire Rods.

Table listing prices for 300 Tons American fines.

Scrap Material.

Table listing prices for 150 Tons No. 1 Wrought Scrap, Net, 150 Tons No. 2 Wrought Scrap, Net, etc.

FINANCIAL.

NEW YORK, Friday Evening, June 29.

Dallness continues to prevail in the mining share markets.

There is little interest taken in mining stocks, because so large a proportion of those dealt in are pure gambles, without any intrinsic value. If the Exchange would kill off the cats and make it more difficult for disreputable schemes to get a quotation, there would grow up an interest in good mines, and in time mining stocks would be held in higher esteem than "gambling chips," which is about the way they are valued now.

There is nothing doing in the different Colorado stocks, and some of them are selling at extremely low prices, considering the outlook of the properties. Colorado Central is quoted at from \$1.95 to \$2. Dunkin, which has just declared a dividend, is selling at 25c. Little Chief is neglected; one sale was made at 23c. The same may be said of Little Pittsburg, which sold at 18c.; Chrysolite at 40c. to 41c., Silver Cord at 31c., Security at 3c., Lacrosse at 10c., and Cashier at from 9c. to 12c.

Silver King continues to decline, and sold as low as \$1 this week. We have been unable to learn the reason for this movement. The last reports received some weeks ago, were favorable, and since then we have heard of nothing which would justify this sudden downward movement in the price. Sales were made to-day at from \$1.35 to \$1.88.

There is nothing new to report in reference to the Plymouth Consolidated Gold Mining Company. The price of the stock remains at \$8 to \$8.50.

No attention is directed to Brunswick, which is selling at from 15c. to 17c.

The only business done in the Quicksilver stocks was done in preferred at \$35.50.

Bodie Consolidated continues to be steady at from \$2.30 to \$2.35. Bulwer sold at from 50@60c. Standard advanced from \$1 to \$1.50. Mono was quoted at \$1.60, and Consolidated Pacific at 10c.

Green Mountain is selling at 4c., and Taylor Plumas at 1c.

Astoria so far keeps quiet at 25@26c. Hollywood was active at from 41@44c. Middle Bar and Amador show the usual business, the former at from 43@44c., and the latter at from \$2.25@2.50.

One sale of the Silver Mining Company of Lake Valley was made to-day at 40c.

A correspondent of the Pittsburg Chronicle-Telegraph, June 18th, says: "Can you inform the public if the following statement is correct, with reference to the financial status of La Noria Mining Company of the State of Kentucky? Capital stock, \$5,000,000; 200,000 shares at \$25 each; amount paid for mine, \$90,000; bonus to ground floor stockholders, 100,000 shares, valued at \$3 per share, \$300,000; 60,000 shares at \$1.50 per share, to second floor stockholders, \$90,000, to provide cash for payment on mining property, leaving 40,000 shares to be sold by the company to equip said mine. Four dollars per share, said to be net proceeds of same, viz: \$160,000. In this way one can

account for the whole number of shares issued, viz: 200,000.

Table showing Amount paid for machinery \$100,000 and Balance unaccounted for \$60,000.

"What has been done with this balance of \$60,000? If the company is now in debt, as stated, we must suppose it has departed along with the woodbine. What is the company going to do about it—make an assessment (voluntary, of course) or hang up the fiddle and stop the dance?"

We do not, of course, know the answer to this conundrum. The many honorable gentlemen who are in the directorate of La Noria owe it to the stockholders to have the mine and the facts concerning its management investigated by competent and disinterested experts, and to have them published.

We believe they will find that the mine never had the value represented, that it was a worked out old Mexican mine, that the dumps do not contain pay ore; in fact, run perhaps only \$7 a ton in rebellious silver, and that no explorations of value have been made, the work being mostly confined to cleaning out Mexican workings that every one knows never contain anything of value. The president of the company, after denying that the company had sold or was selling its quicksilver, finally admitted that it had done so; but an investigation into the precedents of this gentleman will show other things not to his credit. It will probably show that the mill ordered by the company was unsuited to the ore, and, in a word, the stockholders' money has been wasted, and there is little value to show for it.

Notwithstanding the partial settlements of the difficulties of the Suro Tunnel Company, the price has

IMPORTATIONS AT NEW YORK FROM JUNE 20 TO JUNE 27, AND FROM JAN. 1 TO SAME DATE.

Large table with multiple columns listing importations for various materials like Spelter, Steel Sheets, Old Rails, Sheet Iron, Scrap Iron, Tin, Pig Lead, Tin Plates, Bar-Iron, Steel & Iron Rods, and EXPORTS for Copper, Copper Matte, etc.

WEEKLY REGISTER OF CURRENT QUOTATIONS.

Table of chemical and mineral prices including Sulphur, Flour, Tannin, Vermillion, and various acids and salts.

Table of building materials including Bricks, Haverstraw, Front bricks, and Building Stone.

Table of rarer metals including Aluminum, Arsenic, Barium, Bismuth, Cadmium, Calcium, and others.

Table of common metals including Iron, Steel, and various alloys and fastenings.

Table of iron and steel prices including American Pig-Iron, Scotch Pig, and various grades of steel.

Table of Philadelphia prices for various iron and steel products.

Table of stock market quotations for Baltimore, Md., listing various companies and their stock prices.

Table of stock market quotations for Birmingham, Ala., listing various companies and their stock prices.

Table of stock market quotations for Pittsburg, Pa., listing various companies and their stock prices.

Table of Louisville prices for various commodities and materials.

Table of coke or bituminous pig prices for various foundries.

Table of foreign quotations for various gold and silver prices.

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Table of foreign quotations for various gold and silver prices.

Table of Philadelphia prices for various iron and steel products.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS, and NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS. Lists various mining companies and their financial details.

Gold, Silver, Lead, Copper. Non-assessable. This company, at the Western, up to Dec. 10th, 1881 paid \$1,400,000. Non-assessable for three years. The Deadwood previously paid \$75,000 in eleven dividends, and the Terra \$75,000. Previous to the consolidation in Aug. 1884, the California had paid \$31,320,000 in dividends, and the Con. Virginia, \$2,280,000. Previous to the consolidation of the Copper Queen with the Atlanta, Aug. 1875, the Copper Queen had paid \$1,350,000 in dividends.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name and Location of Company, dates from June 23 to June 29, and Sales figures.

*Assessment unpaid. *Dealt in at the New York Stock Ex. Unlisted Securities Dividend shares sold, 18,628. Non-dividend shares sold, 64,540. Total New York, 83,168.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names, dates from June 22 to June 28, and sales figures.

*Ex-dividend. Boston: Dividend shares sold, 6,234. Non-dividend shares sold, 21,945. Total Boston, 28,179.

COAL STOCKS.

Table of Coal Stocks, listing company names, par value of shares, and prices from June 23 to June 29.

*Bid. *Asked. **Of the sales of this stock, 33,930 were in Philadelphia, and 109,380 in New York. Total sales, 177,220.

San Francisco Mining Stock Quotations.

Table of San Francisco Mining Stock Quotations, listing company names and closing quotations from June 22 to June 28.

ALUMINUM BRONZE.

ALUMINUM IRON. ALUMINUM BRASS.

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Silica.....	0.025 "	CARBONATE of SODA.....	98.467 "
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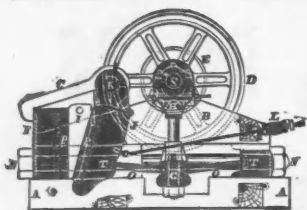
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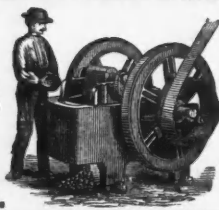


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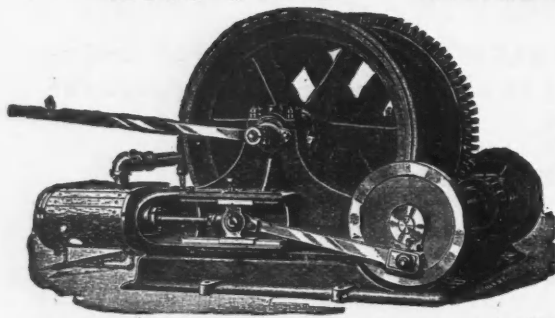
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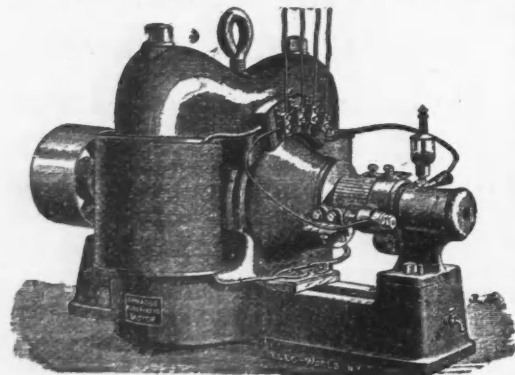
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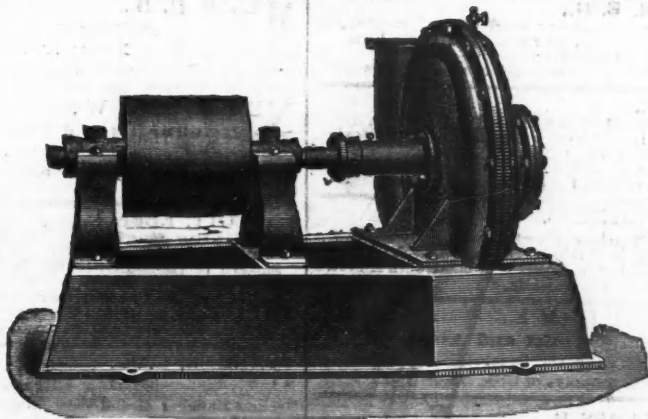
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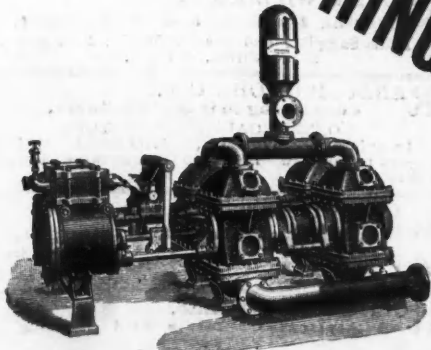
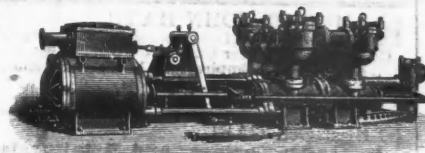
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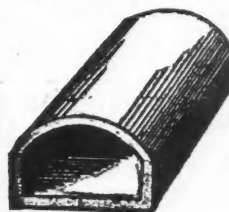
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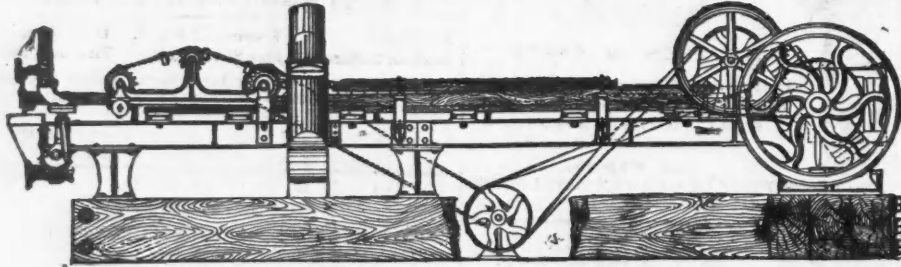
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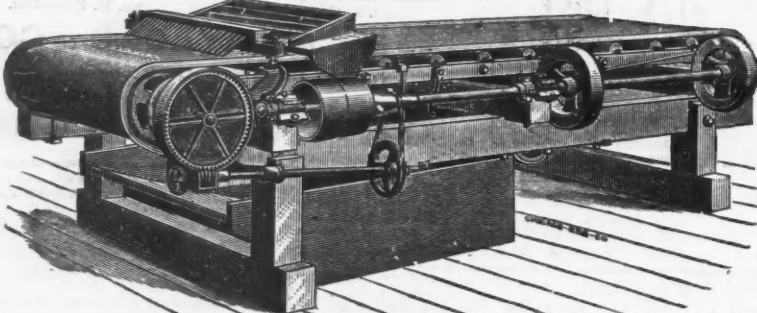
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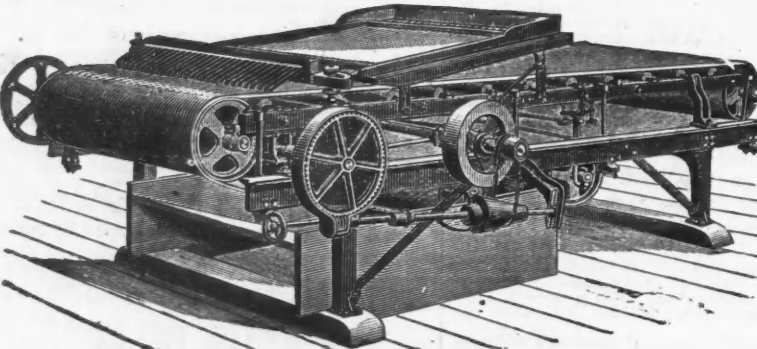


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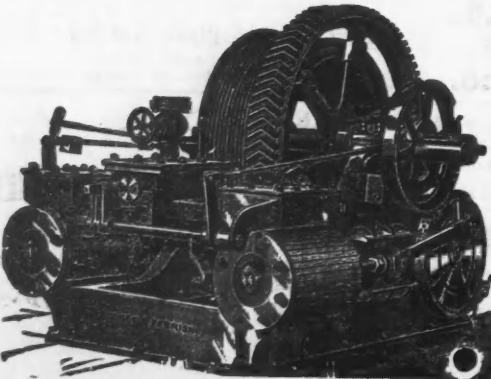
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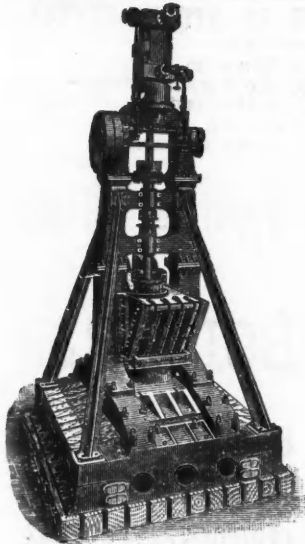
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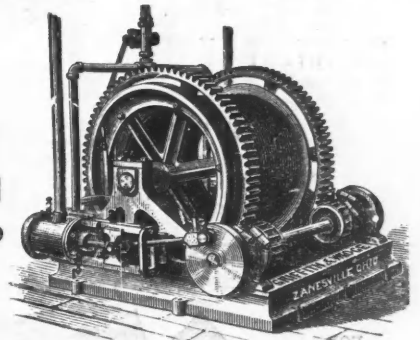
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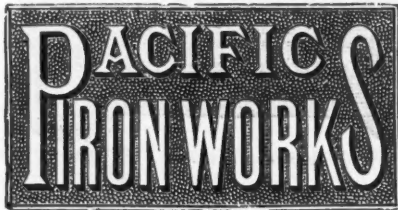


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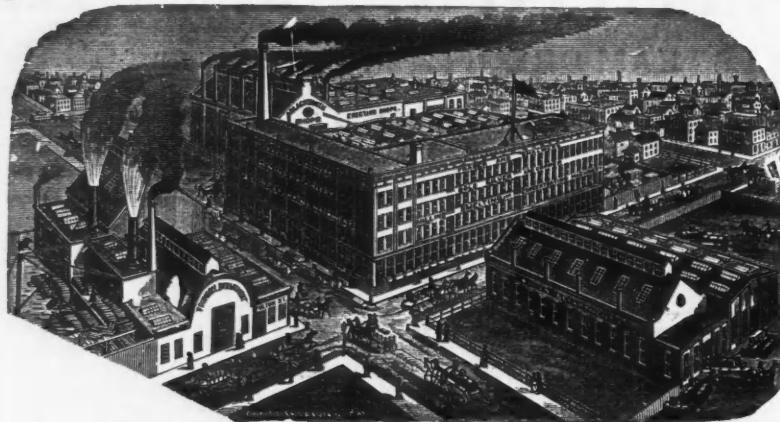
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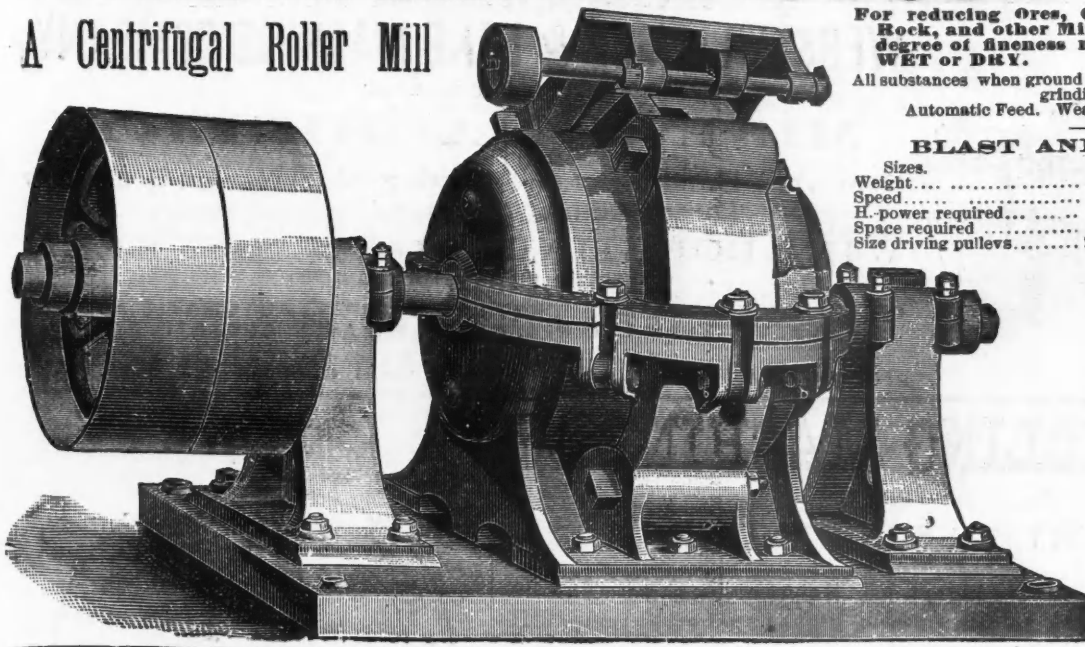
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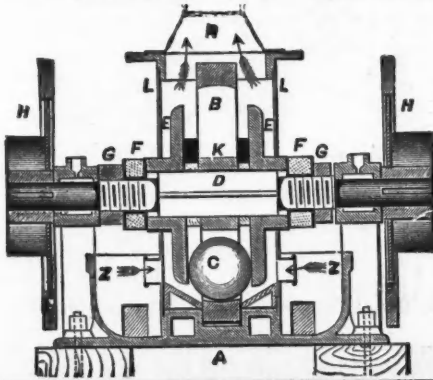
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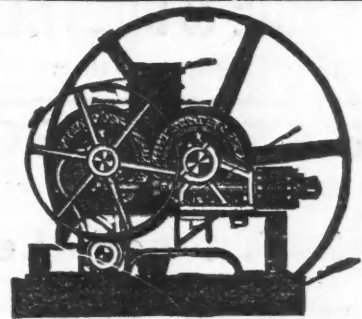
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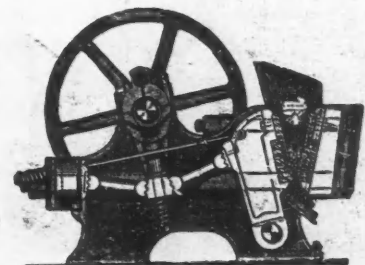
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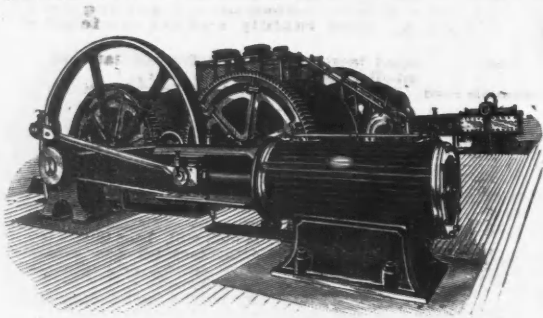
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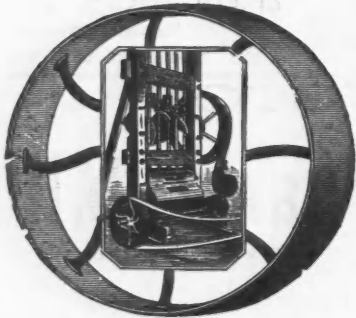
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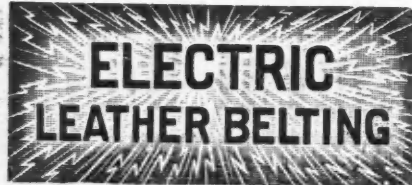
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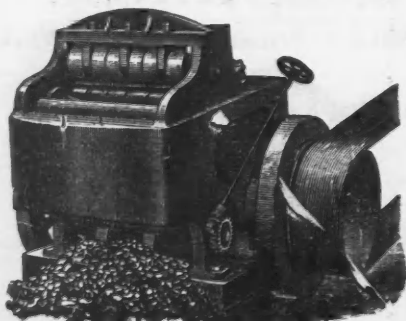
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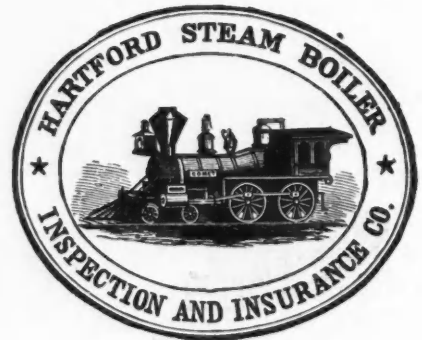
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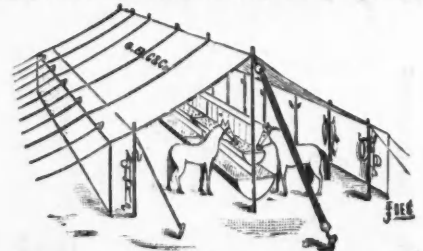
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THE UNION ELECTRIC COMPANY, PHILADELPHIA,

Makes a specialty of Dynamos and Motors for mining purposes, such as hauling, hoisting, ventilating, pumping and drilling. This company has built, and has now in operation in Lykens, Pa., THE ONLY ELECTRIC MINE ROAD IN AMERICA. The only electric mine roads now running are:

	Built by.	System.	Length.	W. of locomotive.	Largest load.	Speed.
Zankerode, Germany.....	Siemens & Halske.	Siemens & Halske.	2,028 feet.	3,000	13½ tons	8 miles
Paulus & Hohenzollern, Germany.....	"	"	2,400 "	4,200	6 "	6 "
Lykens, America.....	Union Electric Co.	Schlesinger.	6,300 "	15,000	150 tons	6-8
Lykens " (under construction).....	"	"	7,100 "	15,000	.....	6-8

THE OFFICE IS AT 123 NORTH SECOND STREET, PHILADELPHIA.

The officers of the company are: WM. L. McDOWELL, President; B. A. VAN SCHAICK, Treasurer; J. I. McDUFFEE, Secretary; WM. M. SCHLESINGER, Electrician.

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SOLE MANUFACTURERS OF

Hard Vulcanized Fibre,

For Electrical Insulation, Friction Brakes, Engine Gibs and Mechanical Uses.

Flexible Vulcanized Fibre,

For Water and Oil Packings, Pump Valves, Carriage Axle Washers and General Purposes.

Cheaper and Better than Leather or Rubber.

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The latest out: ELECTRO-DEPOSITION. A Practical Treatise on the electrolysis of Gold, Silver, Copper, Nickel and other Metals and Alloys, and Electro-Metallurgy. By Alexander Watt. London, 1887. Sold by Scientific Publishing Company P.O. Box 1833, 27 Park Place, New York. Price, \$3.50.



SAWYER-MAN ELECTRIC CO.

LICENSED OF CONSOLIDATED ELECTRIC LIGHT CO., OWNER OF THE SAWYER-MAN PATENTS.

General Offices: Mutual Life Bldg., 32 Nassau St., New York City.

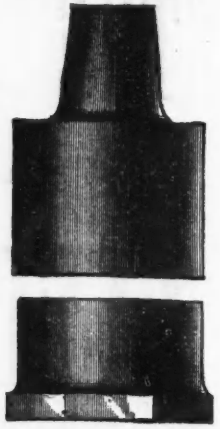
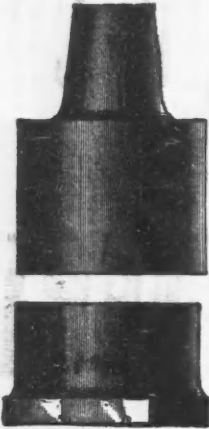
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The Dynamo of this Company is Automatic in its regulation, and will maintain a Uniform Light, with all or any portion of the Lights in circuit. Our Lamp will not blacken, and will maintain its candle-power during its Guaranteed Life. PLANS and ESTIMATES furnished for all kinds of INCANDESCENT LIGHTING. ESTIMATES FURNISHED for the THOMSON-HOUSTON system of ARC LIGHTING.

SCAIFE'S CORRUGATED IRON, LIGHT, FIRE-PROOF, EASILY ERECTED.
THE BEST FOR ROOFING DURABLE. CHEAP.
AND SIDING MILLS, SMELTING WORKS, AND BUILDINGS.
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WM. B. SCAIFE & SONS,
SEND FOR CIRCULAR AND PRICE LIST. 119 FIRST AVE. PITTSBURG, PA.

ADAMANTINE SHOES AND DIES FOR STAMP-MILLS.

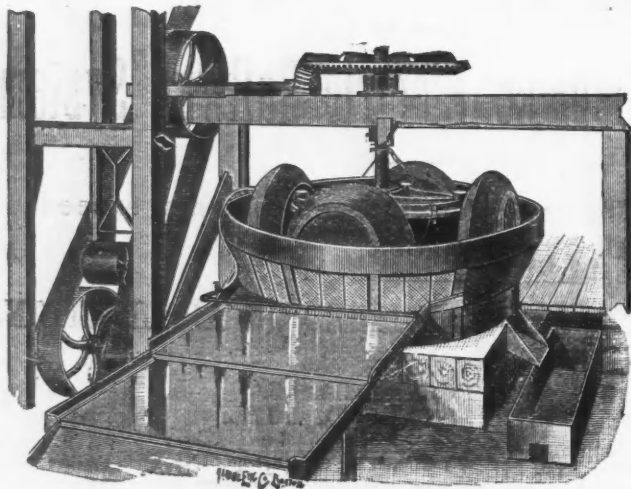


Recent great improvements in material used and manner of casting have resulted in producing a SHOE and DIE that will outwear at least three sets of the best cast-iron. Our SHOES and DIES will not "cup" or break at the shank. **SEND FOR ILLUSTRATED CIRCULAR.** When ordering, send rough sketch, with dimensions. We invite correspondence, and agree to give a substantial guarantee.

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BROOKLYN, N. Y.

Wiswell Ore Pulverizer and Amalgamator Combined.



The following testimonials from Mr. Marsden, of the firm of Farrel & Marsden, manufacturers of stone-breakers and ore-crushers, Ansonia, Conn., speaks volumes for the Wiswell Mill:

Wiswell Electric Mining Machinery Co.:

GENTLEMEN: After carefully inspecting your mill and seeing it in operation, I do not hesitate to say that it is one of the best, if not the best pulverizer, and most complete gold-saving machine I have ever seen.

Please accept congratulations for your success.

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Delivered on Board Cars. For further information, address

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A good authority on mill construction says "Put a corrugated iron roof on your mill. It won't cost much, and you won't have to keep a man on the roof with a pail of water putting out the fires that are bound to start."

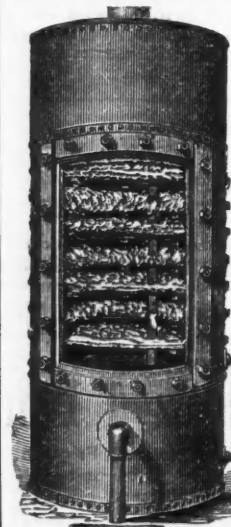
To which should be added: In buying, always be particular to deal with a first-class concern, one with a record of giving unequalled satisfaction to customers—for instance

THE CINCINNATI CORRUGATING CO.,
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WIRE ROPE
GALVANIZED SHIP RIGGING, MINING, TILLER,
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SWEDISH IRON WIRE, CRUCIBLE STEEL WIRE.
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ELEVATOR, CONVEYOR, AND DRIVING BELTS.
Roller Chain Elevators will not Slip or Clog.
Roller Chain is Strong and Durable.
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IS THE ONLY LIME-EXTRACTING HEATER THAT WILL Prevent Scale in Steam

BOILERS, Removing all Impurities from the water before it enters the boiler. Thoroughly tested; over 3000

of them in daily use. This cut is a fac-simile of the appearance of a No. 1 Heater at work on ordinary lime-water when the door was removed after the Heater had been running two weeks.

Illustrated Catalogue. Stilwell & Bierce Mfg Co., DAYTON, OHIO.

HENDERSON STEEL.

The subscriber is prepared to erect steel-works to use his patent processes.

The owners of the patents will grant shop right license at a nominal price, when the works are built by the subscriber.

The advantages of the processes are use of lowest grades of pig-iron to make highest grades of tool and soft steel. Saving of fuel and waste.

Economy of production, cost of ingot above pig being but about \$3 per ton. Address

JAMES HENDERSON,
Belleville, New Jersey.

Outlet Sewer for Village of Mount Vernon.

SEALED ESTIMATES OR PROPOSALS for constructing an outlet sewer for the Village of Mount Vernon, in Westchester County, N. Y., will be received at the Room of the Trustees of said village, in Dearborn's Building, on Fourth Avenue, in said village, until 8 P. M., on the 9th day of July, 1888.

The work of construction is divided into three divisions as follows, to wit:

Division One—Consisting of about 450 linear feet of timber and plank sewer, 30 inches in diameter, and about 850 feet brick and masonry sewer, egg shape, 26 by 36 inches and two manholes.

Division Two—Consisting of about 6118 linear feet, concrete and masonry sewer, about same dimensions, with six manholes.

Division Three—Consisting of about 1368 linear feet, concrete and masonry sewer, about same dimensions; about 100 feet, 20-inch cast-iron pipe sewer, and about 1497 feet vitrified stone-ware pipe sewer.

N. B.—The above statements are only approximate and general. Persons proposing to bid must obtain and examine a printed copy of the proposals, specifications, contract, and bond, mentioned below, and be guided thereby.

Estimates or proposals must be made upon and for each of said divisions separately, and the contract for each division will be awarded separately.

Estimates or Proposals must be addressed to "The Committee on Water and Sewers."

At said place and hour the estimates or proposals will be publicly opened by the Board of Trustees of said village, and the contract for each of said divisions will be made as soon thereafter as practicable.

Printed copies of the form of estimates or proposals, the contract, specifications and security bond can be obtained until said date at said room, from the said committee; and the plans, drawings and profiles for the work can until said date be seen at said room. Mr. William E. Worthen is the Engineer of the Village in charge of the work. His office is at No. 13 Bleekerstreet, New York City.

Dated June 19th, 1888.

By order of the Board of Trustees of the Village of Mount Vernon.

DAVID QUACKINBUSH,
Village President.

JAMES H. JENKINS,
Village Clerk.

DAVID C. CURTIS,
Chairman of Committee on Water and Sewers.

FOR SALE—MACHINERY, ETC.

FOR SALE—A No. 3 PROSPECTING DIAMOND DRILL, made by the American Diamond Rock Boring Company, with very complete outfit, including boiler, pumps, hose (in sections), tripod, 800-foot drill rods, etc. Has bored less than 3000 feet; is in complete order. Will be sold at a bargain. Address RHODE ISLAND PROSPECTING COMPANY, Newport, R. I.

FOR SALE, CHEAP—TWO PAIRS KROM'S New Swinging Block STEEL ROLLS, good as new. THEODORE A. BLAKE, New Haven, Conn.

FOR SALE—MACHINERY. SPECIAL BARGAIN.

NEW MACHINERY. NEW CRUSHER AND CORNISH ROLLS.

We have for immediate delivery, f.o.b. cars at Denver, Colo.:

One new improved 15 x 10 Blake Ore Crusher, with extra sets of wearing parts. Price, \$400.

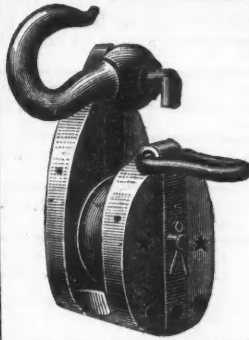
One new set 22 inch diameter by 14 inch face Cornish Crushing Rollers, all complete, with extra tires and distributor spouts. Price, \$450.

One new set 20 inch diameter by 14 inch face Cornish Crushing Rolls, all complete, with extra tires and distributor spouts. Price, \$375.

This machinery is all new, and made from our latest patterns, and at the prices quoted is an unusual bargain.

ALL GUARANTEED FIRST-CLASS.

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FORT SCOTT, KANSAS.



BOSTON AND LOCKPORT BLOCK CO.,

Successors to Bagnall & Loud Block Co. and Penfield Block Co.,
Factories at BOSTON, MASS., and LOCKPORT, N. Y.,

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Also we have the best Differential Hoist in the market, being both Durable and Low-Priced. Would also call attention to our Hand Power Pump, capacity 3,500 gallons per hour, being Non-Chokable.

SEND FOR PRICE LIST.

IMPROVED SNATCH BLOCK, BOSTON MAKE. 162 COMMERCIAL STREET - BOSTON MASS.

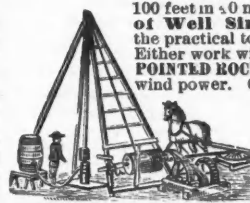
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We have sunk 500 feet in ten hours with the HYDRAULIC REVOLVING PROCESS, 100 feet in 40 minutes with the JETTING PROCESS. We issue an "Encyclopedia of Well Sinking Appliances," containing 800 engravings, illustrating the practical tools used in Well Sinking. We also publish a treatise on natural gas. Either work will be mailed on receipt of 25 cents. We manufacture DIAMOND POINTED ROCK DRILLS, Deep Well Pumping Machinery, run by horse, steam or wind power. Can direct purchasers to where wells are needed for oil, gas, water or minerals. We are suing parties for infringing our patents. See that you are not dealing with infringers. Our inventions and the quality of our work had made us great. We have the largest variety of well machinery, and make more well supplies than all the other manufacturers combined. Inducements to the trade.



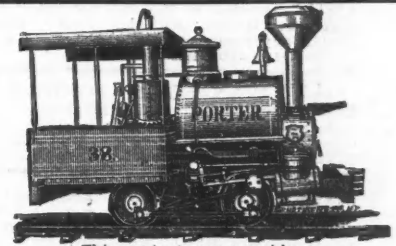
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MAKE CHEAPER AND BETTER COKE THAN ANY BEE-HIVE OVEN. A Practical Success at the Largest German and French Works.

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131 Mulberry St., New York. Mining and Railroad Companies, Contractors, Builders, Farmers, Mill Owners, etc., furnished with laborers on short notice, satisfaction guaranteed in all cases. Best City References Given. Orders solicited and promptly attended to.

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SUPERINTENDENTS of Mines, Smelting Works, Furnaces, etc., ENGINEERS, CONTRACTORS, and CONSUMERS of Mining and Engineering Supplies generally, will consult their best interests by frequent reference to the Advertising Columns of the ENGINEERING AND MINING JOURNAL. Its pages contain THE LARGEST LIST OF RELIABLE MANUFACTURERS AND DEALERS in these supplies, to be found in any paper published on this continent.

FREE ADVERTISING.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE.

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

Applicants should inclose the necessary postage, for forwarding their letters.

Positions Vacant.

382 WANTED—A FOREMAN FOR RUNNING a large sized (Rachette) copper furnace on roasted ores. An experienced smelter will find a permanent position with good salary and a free house to live in. Address, with references, stating experience, WETHERILL, care of ENGINEERING AND MINING JOURNAL.

389 WANTED—A THOROUGH AND PRACTICAL machinist to take charge of machine shop; must be well posted on saw mills and general job work. Address with particulars, EMERY, care of ENGINEERING AND MINING JOURNAL.

390 THERE WILL SHORTLY BE A VACANCY on the editorial staff of the ENGINEERING AND MINING JOURNAL. Qualifications: Some practical experience in Mining and Metallurgy and literary ability. Applicants should state fully experience, references and salary expected, and should read German and French or Spanish. Address MANAGING EDITOR.

391 WANTED—A GOOD, COMPETENT SUPERINTENDENT in a wood-working machinery manufactory; must understand the building of wood-working machinery, handling of men, drafting and designing of new machinery if necessary. Address, with references and particulars, FAGOT, care of ENGINEERING AND MINING JOURNAL.

393 WANTED—AN ASSISTANT MANAGER in a large chemical works. Must be a chemist, and familiar with machinery and manufacturing operations. Address, with references, stating salary expected, HELVE, care of ENGINEERING AND MINING JOURNAL.

394 WANTED—A MAN WHO THOROUGHLY UNDERSTANDS the mining of crude earth paints. Address, with references and particulars, IDRIA, care of ENGINEERING AND MINING JOURNAL.

396 WANTED—FOR ABOUT TWO MONTHS, in the interior of Pennsylvania, a draftsman familiar with locomotive work. Address, stating experience and salary expected, KANN, care of ENGINEERING AND MINING JOURNAL.

397 WANTED—A FOREMAN FOR A BRASS foundry, thirty furnaces; must thoroughly understand mixing of metals and be capable of handling men. Address, with references, LEADER, care of ENGINEERING AND MINING JOURNAL.

398 WANTED—A CONTRACTOR ON MACHINE construction work; a reliable, prompt, capable man who can handle a gang of men. Address, with particulars, MUCK, care of ENGINEERING AND MINING JOURNAL.

399 WANTED—AN EXPERIENCED MECHANICAL Draughtsman. Address, with particulars, stating age, experience, and compensation wanted, NICKEL, care of ENGINEERING AND MINING JOURNAL.

400 WANTED—A GOOD MACHINIST for works in Pennsylvania. A young man preferred. Address, with references and particulars, OVAL, care of ENGINEERING AND MINING JOURNAL.

401 WANTED—A SMART, YOUNG, INGENUOUS Mechanic, who understands working small tools, drills, etc. Address, with particulars, PATERA, care of ENGINEERING AND MINING JOURNAL.

402 WANTED—A FIRST-CLASS Draughtsman, experienced in machine tools for machine-shop and railroad use. Address, stating experience, age, and salary wanted, QUERE, care of ENGINEERING AND MINING JOURNAL.

Machinery and Supplies Wanted.

WANTED—A second hand Root or Baker blower in good condition, numbers 4, 4½ or 5. Address Buc, care of ENGINEERING AND MINING JOURNAL.

MILL MACHINERY for 30-ton cotton-seed oil mill wanted by W. C. & L. Lanier, West Point, Ga.

DRILLS, hand or steam power, or small diamond drills, to bore ¾ to 1; inch holes, wanted by A. M. Smith, Box 301, Greensboro, N. C.

GOLD MINING MACHINERY wanted by J. M. Bush, Sycamore, Ala.

HOISTING ENGINE, BOILER, MINING CARS, etc., wanted by the Black Diamond Coal Co., Knoxville, Tenn.

ELECTRIC LIGHT MACHINERY, capacity 25 16-candle power lights with 40 horse-power boiler and 35 horse-power engine, wanted by H. E. Kedney, Winter Park, Fla.

MARINE BOILER AND ENGINE wanted by J. W. Graizer, Kinston, N. C.

ENGINE BOILER wanted for saw-mill machinery by H. D. Terrell & Co., Conyers, Ga.

ENGINE AND BOILER, second hand, 60 to 75 H. P. and axe handle machinery wanted by Hartzell & Caldwell, Guyandotte, W. Va.

BOILER—A 75 to 100 H. P. boiler for 2000 spindle cotton mill. Address Morganton Manufacturing Company, Morganton, N. C.

TRACTION ENGINE, 10 H. P., without water tank, wanted by Harden & Stiel, Odenville, Ala.

TRAM CARS, two tons, wanted by the Etowah Iron and Manganese Company, Atlanta, Ga.

STONE QUARRYING MACHINERY wanted by the Chattanooga Marble and Stone Company, Chattanooga, Tenn.

WEIGHING MACHINERY, platform scales, about three tons capacity, for weighing apples, wanted by the Bentonville Evaporating and Canning Company, Bentonville, Ark.

SITUATIONS WANTED.

Advertisements under this heading will be charged only 10 cents a line.

SI ALIA, EN LOS ANDES DEL CHILE O del Perú, se le ofrecia una buena colocacion en camins de hierro, ó para la explotacion de minas de oro ó plata, se iria un ingeniero, de quien la direccion es B. de FOREL. Care ENGINEERING AND MINING JOURNAL.

ANALYTICAL AND PRACTICAL CHEMIST; sulphuric and nitric acids, glycerine, ammonia, a specialty; desires an engagement. Address CHEMIST, P. O. Box 1592, New York City.

AN EXPERIENCED ANALYTICAL CHEMIST and Assayer is open to engagement. Best of references from past and present employers. Address "B.," Post-Office Box 360, Washington, D. C.

WANTED—SITUATION BY A MINING Engineer of good experience in coal and iron mining in England, and holding government certificate of competency. J. H. W., care ENGINEERING AND MINING JOURNAL.

CHEMIST AND METALLURGIST, GRADUATE of technical school, with two years practical experience, desires a position as chemist for a blast-furnace, or as assistant to superintendent. Best of references given. Address BLAST-FURNACE, care of ENGINEERING AND MINING JOURNAL.

GRADUATE ENGINEER, 32 YEARS OF age, wants a position as Assistant to-Superintendent of Construction or Operation of Steel or Iron-Works. Can make plans for furnaces, buildings, etc., take charge of erection, and assist in management of works after completion. Best of references. Address S. I. C., this office.

METALLURGICAL CHEMIST DESIRES an engagement with a steel-works, iron-works, or blast-furnace. Has had eight years' experience in all branches of steel and iron work, and can furnish highest references and testimonials from former employers. Address H. C. W., Care ENGINEERING AND MINING JOURNAL.

WANTED—AN ENGAGEMENT AS MINING Foreman or Mechanical Engineer. Ten years experience in mining hard and soft ores, and also the patentee of a deep mine pump being tested to 200 feet straight lift with a demonstrated success. Will erect the plant and take charge of all pumping machinery at the mine. Was last employed as superintendent at zinc mines. Satisfactory references. Address E. HEDBURG, 1872 Terrace street, Kansas City, Mo.

A FIRST-CLASS AT PLACER MINING and milling gold ores. Want a position. Address O. M. B., 145 Broadway, Room 19, New York City.

WANTED—AT ONCE, A THOROUGHLY qualified and experienced metallurgist and chemist to take charge of the reduction works of a large silver-lead mine in Australia; must be conversant with the smelting of ores of lead and silver, and with their treatment by the most modern processes. Write, with full particulars of previous experience, age, and references, and salary expected, to "ARGENT," care of Messrs. Street & Co., 30 Cornhill, London, E. C., England.

A YOUNG MAN WITH A GOOD PRACTICAL knowledge of assaying, analytical chemistry and metallurgy, would like a situation as assayer or assistant manager of mining or reducing works. Good references. W. W. NORTON, Syracuse, N. Y.

A YOUNG MAN WHO HAS JUST COMPLETED two years in the metallurgical course at Columbia College, and has had several years experience in machine shop work and at surveying, would like to obtain a position in some large iron or steel works, or with a mining company, where there is a chance to rise rapidly. Address METALLURGIST, care ENGINEERING AND MINING JOURNAL.

DIVIDENDS.

OFFICE OF THE DALY MINING COMPANY, MILLS BUILDING, 15 BROAD STREET, NEW YORK, June 16, 1888.

DIVIDEND NO. 16.

A dividend of TWENTY-FIVE (25) CENTS per share has been declared for May, payable 30th inst. Transfer-books close on the 26th inst.

LOUNSBURY & CO.

OFFICE OF THE DUNKIN MINING COMPANY,

NEW YORK, June 25, 1888.

DIVIDEND NO. 25.

The Board of Directors of this Company have declared a quarterly dividend of TEN THOUSAND DOLLARS, being FIVE CENTS per share, payable July 16th, at the Farmers' Loan and Trust Company, 22 William street, New York City. Transfer-books close July 2d and re-open July 17th.

JAMES C. ELMS, Secretary.

To Stockholders of the Sutro Tunnel Company Who Have Not Assented to the Plans of Reorganization.

A guarantee syndicate having been formed, stockholders who have not assented heretofore to the plans of reorganization, but wish to protect their stock from being rendered valueless through foreclosure, must forthwith deposit their shares with the Union Trust Company, No. 73 Broadway, New York, pay the sum of fifty-five cents per share and receive therefor the Trust Company's negotiable receipts, which will entitle the holder after completion of the reorganization to the same number of shares of stock as now deposited by him and new first mortgage income 4 per cent bonds in the proportion of one dollar for each fifty-five cents cash now paid.

The time for depositing stock and payment of subscriptions expires on July 11, 1888, at 3 P. M.

Payments should be made by check on New York to the Union Trust Company, and should be accompanied by the stock duly indorsed in blank, and an authorization to the Union Trust Company; blank forms for this authorization and copies of circulars can be obtained upon application at the Union Trust Company's office, or at room 19, 7th floor, Mills Building. Interest at the rate of 4 per cent. will be allowed on subscriptions from the date of payment.

For the Reorganization Committee,

H. R. BALTZER, Chairman.
NEW YORK, June 21, 1888.

MANGANESE ORE.

A gentleman controlling property on which is located a valuable deposit of ore assaying 45 per cent manganese, 12.5 per cent iron and 0.29 per cent phosphorus, is desirous of disposing of part of his interest to parties for capital to develop the mine. Full particulars, examination, and references obtained by addressing MANGANESE, care of ENGINEERING AND MINING JOURNAL.

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THE VALUABLE BOOK ON STEAM

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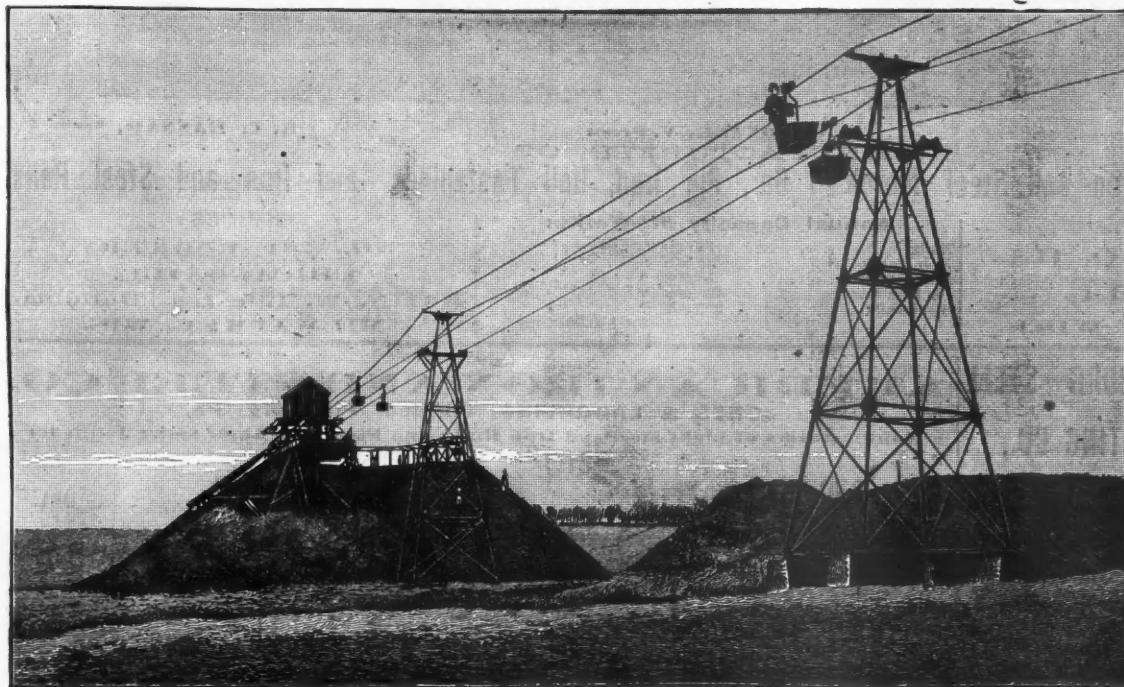
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WIRE ROPE TRAMWAYS.

(BLEICHERT IMPROVED SYSTEM.)

THE BEST AND MOST ECONOMICAL METHOD OF TRANSPORTATION.



Four hundred lines in successful operation from 100 yards to 12 miles in length, and with capacities from 50 to 1500 tons per day.

Individual loads carried from 300 to 2000 pounds.

But little wear on the ropes.

Spans up to 1500 feet already successfully built, and grades up to 45 degrees easily surmounted; and where down-grades exceed up-grades, lines work automatically, requiring no power.

No slipping of the carriers on the rope. No need of filling cars while in motion. All cars automatically detached at terminals or intermediate stations.

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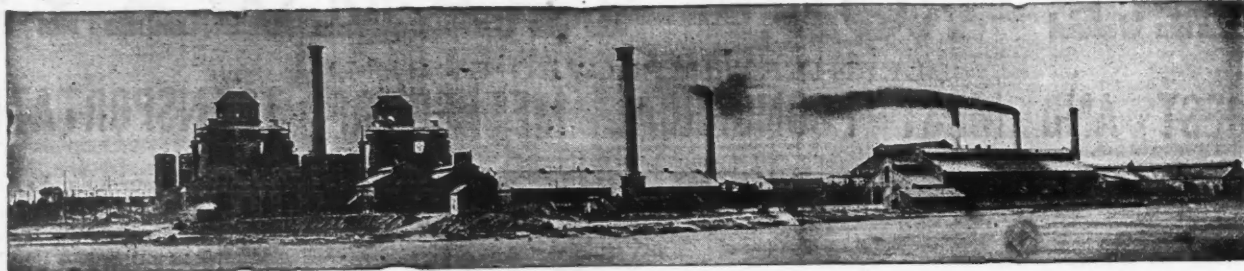
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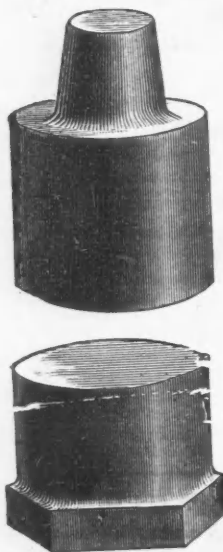
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Pig Iron	425,000 "
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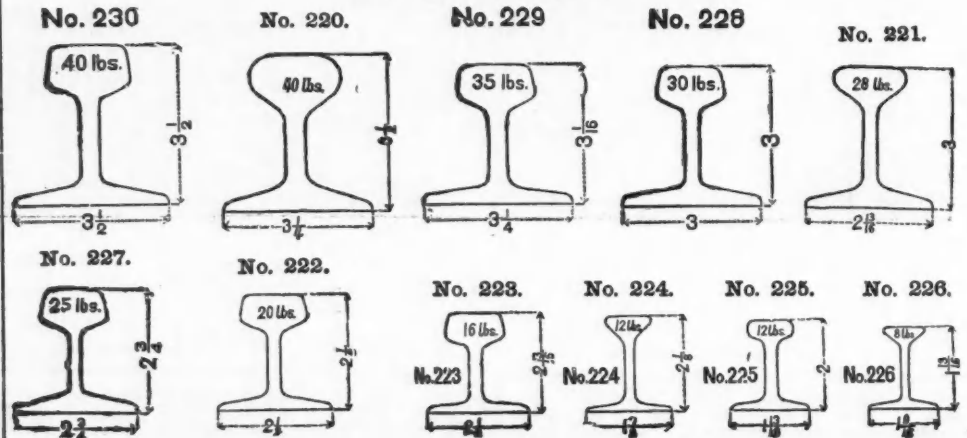
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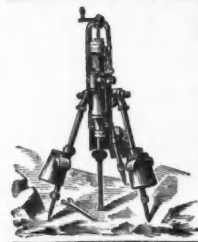
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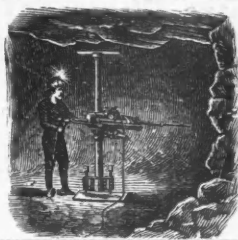


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ADVERTISERS' INDEX.

Table listing various categories of advertisements such as Acid Phosphates, Air Compressors, Assayers, Belting, Blasting Powder, Boilers, Books and Periodicals, Castings, Car Wheels, Cement, Chemicals, Coke Ovens, Coal, Concentrators, Crushers, and Contractors.

Table listing various categories of advertisements such as Concentrators, Crushers, and Pulverizers; Contractors; Copiers; Diamonds; Dividend Notices; Drills, Hatchet; Electric Machines, Dynamos; Elevators and Conveyers; Employment Bureau; Engineers and Chemists; Gas Works; Hoisting Machinery; Hot Blast Stoves; Insurance Companies; Locomotives; Machinery and Supplies Wanted; Metallurgical Works and Processes; Smelting; Water Wheels; Wire Ropes; and Wire Rope Tramway.

Table listing various categories of advertisements such as Mariner & Hoskins; Maynard, George W.; McCulloch, E. A.; McDowell, F. H.; Melle, H. B.; Nell, James W.; Olcott, Eber E.; Palmer, C. E.; Parker, Richard A.; Peters, Edward D.; Potter, William B.; Randolph, John C. F.; Raymond, Rosster W.; Ricketts, Pierre de P.; Rotts, N. H.; Robinson, Bro.; Bolker, Charles M.; Rothwell, Richard P.; Schwartz, Theodore E.; Smith & De Crano; Spilbury, E. G. Ybbon; Stiefeldt, C. A.; Stevenot, Emile R.; Taylor & Brunton; Torrey & Eaton; Trippel, Alexander; Van Diest, P. H.; Winslow, Arthur; Wyatt, Francis; Engineers' Instruments; E. & H. T. Anthony & Co.; Gurley, W. & L. E.; Heller & Brightly; Queen & Co.; Engineers (See Machinery); Financial; American Metal Co.; Gaylor, Saml. A. & Co.; Merchants Nat. Bank of Seattle; Mullally, J. J.; Patton, William L. & Co.; Smith, C. H.; Fire-Brick; Borgner & O'Brien; Denver Fire Clay Co.; Fleming, Howard; Furnaces; Gordon, Stroubel & Laureau; Hoskins, Wm.; Henderson, James; Samuel L. Moore & Son Co.; Witherow, Jas. P.; Gaskets; U. S. Mineral Wool Co.; Gas Works; United Gas Improvement Co.; Hoisting Machinery (See Machinery); Hot Blast Stoves; Gordon, Stroubel & Laureau; Witherow, James P.; Insurance Companies; Hartford Steam Boiler Inspection and Insurance Co.; Locomotives; Porter, H. K. & Co.; Machinery & Supplies Wanted; Machinery For Sale; Metallurgical Works and Processes; Birmingham, Mark.; Electric Bullion Saving Co.; Ledoux & Co.; New York Metallurgical Works; Penna. Lead Company; Smelting; Allis, Edw. P. & Co.; American Well Works; Beckett & McDowell Mfg. Co.; Brown Hoisting & Conveying Mfg. Co.; Carpenter, Geo. B. Co.; Copeland & Bacon; Dederick, P. E. & Co.; Fraser & Chalmers; Griffith & Wedge; Goulds & Austin; Hendrie & Bolthoff Manufacturing Co.; Jeffrey Manufacturing Co.; Moore, Samuel L. & Son; Morris County Machine & Iron Co.; Rankin, Brayton & Co.; Russell Process Co.; Stokes & Parrish Machine Co.; Webster, Camp & Lane Machine Co.; Mining Companies; Probst Mining Co.; San Miguel Co. Mines Co.; Ore Purchasers (See Smelting Works); Packing; Brandt, Randolph; Jenkins Bros.; Vulcanized Fibre Co.; Perforated Metal (See Screens); Phosphor-Bronze; Phosphor Bronze Smelting Co.; Photographers' Supplies; E. & H. T. Anthony & Co.; Positions Vacant; Publishers (See Books and Periodicals); Pulverizers (See Concentrators Crushers, etc.); Pumps (Also See Machinery); Worthington, Henry E.; Goulds & Austin; Quicksilver; Balfour, E.; Railroad Companies; Transvaal Railway; Rock Drills (See Air Compressors); Roofing; Cincinnati Corrugating Co.; Scaife, William B. & Sons; Screen Mesh; Robt. Aitchison Perfor'd Metal Co.; Harrington & King Forging Co.; Newark Wire Cloth Co.; Tyler, W. S.; Shoes and Dies; Chrome Steel Works; Pittsburg Steel Casting Co.; Situations Wanted; Smelting and Refining Works; Baltimore Copper Works; Boston and Colorado Smelting Co.; Cowles Electric Smelting Co.; Orford Copper Co.; Penna. Salt Mfg. Co.; St. Louis Sampling & Testing Works; Steel Rails, Castings, Drill Steel; American Iron & Steel Co.; Cambria Iron Co.; Chester Steel Casting Co.; Chrome Steel Works; Henderson, James; North Chicago Rolling Mill Co.; Pennsylvania Steel Co.; Pittsburg Steel Casting Co.; Tackle Blocks; Boston & Lockport Block Co.; Geo. B. Carpenter & Co.; Tents; Carpenter, Geo. & Co.; Typewriters; Wyckoff, Seamans & Benedict; Valves; Chapman Valve Mfg. Co.; Eddy Valve Co.; Jenkins Bros.; Lindlow Valve Mfg. Co.; Vulcanized Fibre Co.; Vulcanized Fibre; Vulcanized Fibre Co.; Water Purifiers for Boilers; Stillwell & Bierce Manufacturing Co.; Water Wheels; Stillwell & Bierce Manufacturing Co.; Wire Cloth (See Screen Mesh); Wire Ropes; Roebling, J. A. Sons & Co.; Roebling & Macdonald; Wire Rope Tramway; Cooper, Hewitt & Co.

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The electric current can be applied to any stamp mill by adding a large settler to receive the pulps and slimes from stamp batteries and plates. Cost of dynamo \$100 to \$1000, according to the capacity of mill.

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Saves all floured amalgam and mercury, and can be attached and applied to any gold and silver mill at a nominal cost.

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MARK BIRMINGHAM, 42 Broadway, N. Y.

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Proposals are invited on the following contracts before the dates specified, full particulars concerning which can be obtained by applying to the parties whose addresses are given.

850 RAILWAY CONSTRUCTION—Three lines of railway, total length 1175 kilometers, to be constructed in Chili, S. A., with rolling stock, plant, and all accessories complete. Address the Chilean Legation at Washington, or Fred. A. Beelen, Consul-General of Chili, No. 15 Cortlandt street, New York City, until July 30th.

893 ELECTRIC LIGHT PLANT, to be owned and operated by contractor, and the city to take 30 arc lights. Address William Henry, Mayor, Jackson, Miss., until July 1st.

903 WATER-WORKS DAM—Estimated cost, \$10,000. Address Board of Village Trustees, Staun on, Ill.

906 PUMP, to be propelled by water-power, with a daily capacity of three to five million gallons. Address L. P. Rodes, City Engineer, Lynchburg, Va.

911 SHIP RAILWAY.—Construction of the Chignecto Marine Transport Railway, together with docks, basins, and entrance channels. Address H. G. C. Ketchum, Amherst, Nova Scotia.

922 BRIDGE, to be built over Gunpowder River, at head of Loch Raven. One span, 17 feet wide by 167 feet long. Address The County Commissioners, Towson, Md.

923 PIPE, VALVES, AND BUILDING RESERVOIR, about 22,000 feet of 4, 6 and 8 inch pipe, 53 valves, laying of the same, and building a reservoir, 80 by 15 by 10 feet. Address H. W. Bruckenridge, Tarentum, Pa.

925 BRIDGES, four, to be constructed over Salinas River, Monterey County, Cal., including approaches and shore protection. Address H. Samuels, Chairman Board of County Commissioners, Salinas City, Cal., until July 10th.

928 IRON BRIDGE, to be erected on stone substructure, near Junction City, Kansas. Address P. V. Trovinger, County Clerk, as above, until July 5th.

930 WATER-WORKS—Particulars can be learned from the Mayor of Natchez, Miss.

932 ARTESIAN WELL, about 1000 or 2000 feet deep. Address the City Clerk, Uniontown, Ala.

933 WATER-WORKS, with wind engine, tank and pipe. Address L. E. Crews, Town Clerk, Culbertson, Neb., until July 1st.

934 WATER-WORKS for Bound Brook, N. J. [Address the engineer, Isaac S. Cassin, Philadelphia; or, Jos. M. Thompson, President Bound Brook Water Co., Bound Brook, N. J., until July 1st.

935 BRIDGES, ten. Address J. M. Dodge, Clerk of County Supervisors, San Diego, Cal., until July 5th.

936 BRIDGE over Willapa River, span, 145 feet; approaches, 225 and 320 feet. Address E. B. Wood, Oysterville, Pacific County, Washington Territory, until August 6th.

937 IRON BRIDGE—Low truss, single span, 68 feet long, 12 feet wide, capacity 100 lbs. per sq. ft. Address Isaac Dunn, Auditor, Cannelton, Perry Co., Ind., until August 6th.

938 NEW CROTON AQUEDUCT WORK.—Deepening and finishing Shaft No. 24 on Section A, and constructing Head House connected therewith. Address the Aqueduct Commissioners, Room 209, Stewart Building, 280 Broadway, N. Y. City, until July 3d.

939 BRIDGE over Fishing Creek, near Milledgeville, Ga. Address D. B. Stanton, at Milledgeville, until July 3d.

940 BRIDGE. Address City Engineer, Atlanta, Ga.

941 WATER-WORKS for town of 1500 inhabitants. Address John B. Inman, Troy, Tenn.

942 WATER-WORKS. Address W. H. Campbell, Gainesville, Ga.

943 SEWERAGE SYSTEM, to cost \$25,000. Address Mahlon Gore, Orlando, Fla.

944 RESERVOIR, soon to be constructed. Address Robert K. Martin, Chief Engineer Water-Works, Baltimore, Md.

945 IRON BRIDGE with substructure, to be erected over the Passaic River at Avondale, N. J. Address Jas. Owen, C. E., 721 Broad street, Newark, N. J., or Jacob Kierstead, Franklin, N. J., until July 10th.

946 WATER-WORKS—One 2,000,000 gallon compound condensing pumping engine and boilers. About 60,000 feet of 4, 6, 8, 10, 12 and 16-inch cast-iron pipe, with special castings, valves, etc.; also impounding, distributing and high service reservoirs. Address S. M. Sherwood, Secretary Water Commission, Sing Sing, N. Y., until July 12th.

947 BRIDGES to be constructed and specifications to be furnished. Address Geo. L. Fisher, County Clerk, Valentine, Neb., until July 10th.

948 DREDGING—Improvement of Swan Creek. Address L. B. Chamberlin, Local Commissioner Swan Creek Swamp Land State Improvement, Lee's Corner, Mich.

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- II. **FEATS OF RAILWAY ENGINEERING.** Great Tunnels, Bridges, Curves, Trestles, etc. By JOHN BOGART, State Engineer of New York, etc. Many beautiful illustrations.
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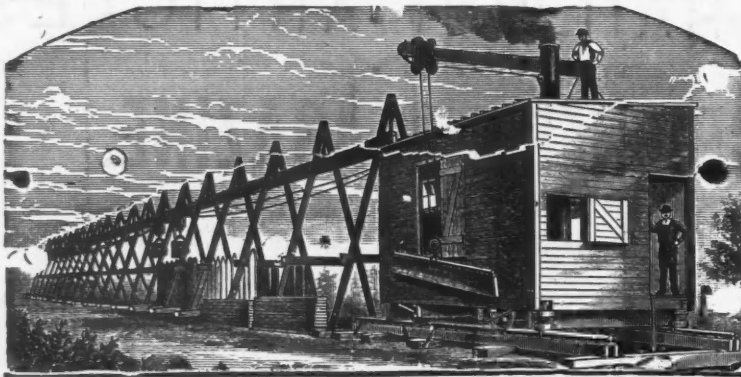
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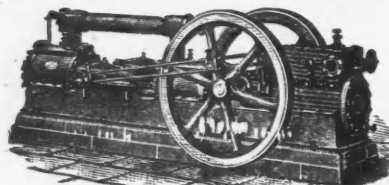


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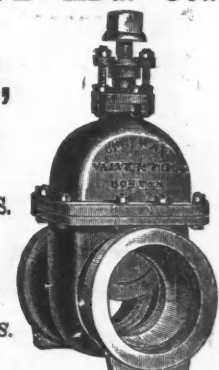
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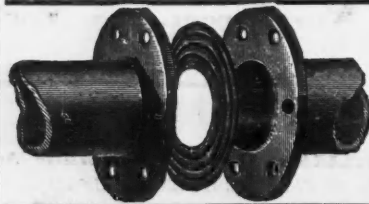
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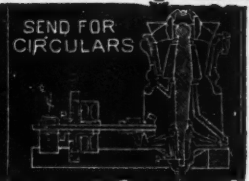
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PLANT (by actual count from Table 13).

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