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The Table of Contents will be found at the end of the reading matter, page 307.

AN illustrated price list of goods for export, giving export discounts, is mailed with this issue of the ENGINEERING AND MINING JOURNAL.

THE decision of the French courts condemning the directors of the Société des Metaux and of the Comptoir d'Escompte bank to enormous penalties for having made and guaranteed contracts that they had no legal right to make, will teach a wholesome, though very severe, lesson.

The court has decided that the directors who held seats in both companies, the president of the bank, and the managing director's heirs must pay \$3,000,000; that ten other directors must pay \$1,200,000, and that \$200,000 must be collected from the bank's censors. The contracts were clearly in violation of the bank's charter and by-laws.

This is the outcome of the effort to corner the world's production of copper.

WE call the attention of our readers to the paper on American Railroad Bridges, by Mr. THEODORE COOPER, M. Am. Soc. C. E., commenced on another page of this issue. This admirable monograph presents the most complete history of bridge building in this country, from the earliest colonial days to the present time, that has yet been written. Mr. COOPER, one of the most eminent members of the profession, makes a specialty of bridge construction, and he has earned the thanks of all engineers for this excellent work, in which he has evidently spared no pains to obtain reliable records of the early bridges built in this country, and in which he gives the detailed specifications of all the bridges representative of the different systems in vogue at the present day. This paper, which is profusely illustrated, will be continued in the next succeeding numbers of the ENGINEERING AND MINING JOURNAL, a fact of which engineers who desire to obtain it should make note.

IN addition to the extracts from the report of the Broken Hill Proprietary Company, of the Barrier Ranges Silver Field, in New South Wales, which we give in another column, together with a plan of the workings, the following facts will be of interest: The general manager is Mr. W. H. PATTON, formerly superintendent of the Consolidated California & Virginia Mine, of Nevada. It is satisfactory to know that this, the greatest silver-lead mine in the world, is under American management, although in an English colony.

The present report is the eighth half yearly, so that the company has been little more than four years in existence. The share capital is \$1,600,000, fully paid, and in July, 1886, the company began to pay dividends, and in less than three years, or up to May of this year, the amount of \$4,040,000 had been distributed. In addition to this the fortunate stockholders have received from sales of surplus ground to other companies \$6,920,000 in cash, and shares in those companies of the nominal amount of \$8,720,000, which in most cases if not in all were equivalent to or better than cash, as they

could at the time be sold at par or at a premium. The production of the mine is apparently still on the increase, and for the past half year was 2,677,686 ounces of silver and 11,418 long tons of lead.

ON another page will be found a letter from a Pittsburg correspondent telling of the collapse of the La Noria mining scheme and referring to the fact that had the investors heeded the warning given in the ENGINEERING AND MINING JOURNAL a year and a half ago (May 19th and 26th and August 25th, 1888), they would have saved their money. Referring to our files of the JOURNAL, May 19th, 1888, we find that we stated on information in our possession that "the La Noria Mining Company, with mines in Zacatecas, Mexico, and whose stock is dealt in principally at Pittsburg, is an utter failure and its management unworthy of confidence." "Proposing investors may well hesitate before buying this stock, and those who have it had better investigate."

As a consequence of this and our subsequent warnings, the president of the company, Mr. CARNAGHAN, was relieved of the management of the company in August, 1888, but at that time we stated that the value of the ore produced was far below the representations made by the promoters. How far these misrepresentations may make the promoters legally liable to the stockholders, we are unable to say, but it is much to be desired that example be made in cases where such liability can be enforced; it would do much to improve the moral standing of the mining business with investors, and would prevent the floating of many disreputable concerns. In this case the stockholders, Mr. JAMES M. BAILEY, JOHN B. JACKSON, A. K. NIMICK, WILFRED H. NEVIN, WM. GUCKERT, and JOSEPH VOGEL, who wrote a widely circulated letter to the stockholders of the La Noria Company, making positive assertions concerning the value of the ore, the cost of treating it and other technical matters of which they evidently were profoundly ignorant, may now realize the embarrassing position in which they placed themselves in "booming" this stock.

CHINESE RAILWAYS.

There seems to be no doubt that in spite of the astrologer's opposition China has become convinced that the one efficacious method of reviving her export trade is the construction of railroads. The recent Imperial decree ordering the construction of the main line from Peking to Hankow means business in earnest.

Whether this result has been attained by the fortunate conjunction of some of the heavenly bodies, as interpreted by the court soothsayers, or whether it has been brought about by the influence of the wiser and more practical advisers of the Emperor, does not signify; the fact remains that we are now to see the greatest of the Oriental nations in extent, in population and in resources, opened up by the iron horse. Various circumstances have been working quietly to this end. The construction and satisfactory working of the short line from the Kaiping coal mines to Yung-chong, about 27 miles, carried out through the energy and foresight of the Viceroy, Li Hung Chang, with Chinese capital, which, although little more than a mineral line, has proved its utility and convenience; the fact of Japan laying her thousandth mile of rails, the whole of which has been constructed with Japanese capital, and a great portion by Japanese engineers; and the most incontrovertible facts that the replacement of junks on the rivers and canals by Chinese and foreign steamers, and the extension of the telegraph system throughout China (for there are now about 100 government telegraph stations in the empire), have not wrought the dire ruin to the country that was predicted.

In the report of the Government Commission on the subject the case is fairly stated. It is admitted that certain interests will suffer, such as freighters and canal carriers, and this will be especially the case with the line now decreed, as it will follow the banks of the canal for the greater portion of its route; but the principle is maintained that it is better for the country that the few should suffer for the benefit of the many. The aid that can be afforded by railroads in times of famine and of sudden disaster in floods, unfortunately so common in China, is pointed out, while from a military point of view, this road, only reaching to within 600 miles of the coast, is shown to be no danger to the Empire from attacking forces from without, and, at the same time, it would afford great facilities for the forwarding of troops and material in case of need. One of the great difficulties in the way of constructing railroads in China is the seeming impossibility of running a line anywhere without disturbing graves; why that should be so, or why, being so, it should be such a well-nigh insuperable obstacle, is not apparent to our profane ignorance, and it seems a somewhat strange reason for the location of a great line that fewer graves need be disturbed on it than elsewhere.

The distance from Peking to Hankow is about 700 miles in a straight line, so that if this undertaking is carried out energetically, as is likely to be the case from the character of the men to whom it has been entrusted, China will probably be able to celebrate the laying of her thousandth mile of railroad within a much shorter time from the initiation of the work

than has been the case with Japan. Long before the completion of this road, however, we may look to see another trunk line commenced connecting the capital with Canton in the south, and possibly some extension to the western frontiers, since strategical reasons are admitted as an argument in favor of railroads.

Looking at this new departure from our own interested point of view, we naturally ask. How are we to benefit by it? and we draw attention to the subject in the interest of our manufacturers. We have already benefited considerably from supplying railroad equipment to Japan, and we believe that Messrs. H. K. Porter & Co., Pittsburg, have furnished more engines for Japanese railroads than all the European makers combined. It is true that the Commission recommend that native materials should be used in the construction of the line, but with all their ingenuity, and with the aid of imported mechanical engineers, we doubt whether the Chinese will be able to construct their own rolling stock and engines for some years to come.

One thing quite certain to result from the introduction of railroads into China is a great addition to the mineral wealth of the world. Many of the Chinese provinces are known to be rich in various useful and precious metals, and it has only been the want of means of transport and lack of knowledge in an industry useless, or nearly so, under the existing conditions that has retarded the development of them. In the prime materials of the world, coal and iron, China is particularly rich, so that in another quarter of a century she may be in a position to manufacture all her railroad equipment, and it is therefore incumbent on us to "make hay while the sun shines."

The opening up of this great Empire to trade will, no doubt, provide a market for many American manufactures, and at the same time it will create a demand for money in China that may call for foreign loans and the utilization of a large amount of silver. This new departure in China may therefore be of interest to our silver producers also.

THE CONGRESS OF THE THREE AMERICAS.

The delegates from the nations of Mexico, Central and South America, who have this week assembled in Washington to meet those representing the United States, have an arduous task before them to accomplish any of the objects set forth in the programme to be discussed. Mere expressions of mutual good-will and courtesy will accomplish nothing; there must be an earnest intention, particularly on the part of our representatives, and a readiness to give and take by all parties to the convention. It should not be difficult to lay the foundation for treaties between all of the powers, dealing with the extradition of criminals, and for a unification of laws relating to the entry of and charges upon shipping; but, beyond this, the interests involved are so divergent that we doubt whether much can be consummated.

Take for instance the two leading questions to be considered, the unification of customs duties and the adoption of a common silver currency. What advantage would it be to the Argentine Republic, the second most important wool-growing and exporting country in the world, to place an import duty on wool equal to ours, and how can the United States delegates, the majority of whom are strong protectionists, agree to recommend that Argentine wool be admitted free of duty? Then with regard to a common silver coin, the result of our agreeing to accept these in exchange for our gold would be that we should have all the coinage of Mexico and the silver-producing countries of South America dumped upon us.

It would be an act of insanity on our part to agree to such a proposition unless we are prepared to adopt a silver standard in place of what we now have. There is no doubt a strong feeling in the country that closer commercial relations with our neighbors on this continent and South America are very desirable and would be very beneficial, but the real means to attain these have been very little studied, and the sooner it is realized that they cannot be gained by talk and conventions, and even by a junketing trip provided for the delegates, the better, and the sooner practical methods will take the place of fancy nostrums.

This tour of inspection of factories, though no doubt well meant, is in questionable taste. It looks a little like brag in the first place, this display of our wonderful manufacturing resources, and would no doubt be appropriate, if we were entertaining delegates from Central Africa or the South Sea Islands, to impress upon uneducated savages our vast wealth and productive power; but when this part of the programme was arranged we think those in charge of the proceedings forgot that the foreign delegates being appointed were highly educated gentlemen, with perhaps a wider experience of the world in its larger sense than those appointed by our own government. It is more than likely that some of them, who are not quite young, consider the journey of more than 5,000 miles an unnecessary addition to their labors.

It is possible, however, that some common ground of action might be taken, in the way of subsidizing steamship lines to run between the various countries. But this only in the event of our willingness to open our markets to the raw products, and to sugar in its unrefined state

Certainly these countries will not be inclined to pay out money merely to receive our manufactured goods, as they already receive all they want of that description from Europe without subsidizing steamships.

Politically there are two great stumbling-blocks to be overcome, and unfortunately they affect two of the most important nations represented, and must more or less have an influence on the minds of other representatives. Chili has not yet forgotten our attempted interference at the time of her troubles with Peru, and our failure to this day to carry into effect the GRANT-ROMERO treaty with Mexico, which has been approved by the Mexican legislature, will naturally lessen the confidence of our visitors in our practical enforcement of the agreements arrived at or recommendations made by the conference. A still worse effect has been produced by the recent action of the administration, which has been interpreted in Mexico as hostile to its interests, and injurious to the commercial relations, so rapidly growing between the two countries. That such action should have been taken on the very eve of the assembling of this congress, nominally for the purpose of promoting closer commercial relations, must necessarily make a very unfortunate impression upon the delegates. We have, however, great confidence that the sagacity and ability of the delegates, and especially that of Mr. ROMERO, the Mexican minister and delegate, will bring out whatever good is possible from this mutual exchange of views, and will remove any difficulties on his side, without too great susceptibility from the rebuff we have given his country. The presence in Washington of Mr. RYAN, our Minister to Mexico, is also fortunate, as from his recent communications to the department, he seems thoroughly to appreciate the situation, and may aid in bringing about a better understanding.

The address of welcome to the delegates by Mr. BLAINE is very encouraging in the wishes and hopes expressed. We hope they will be followed up by practical action. As yet it is *vox, et preterea nihil*.

THE PRODUCTION OF GOLD.

In a paper read last month by Mr. E. BATES DORSEY, at the Newcastle meeting of the British Association, the views already expressed by him on the subject of the Transvaal in these columns are amplified. The future that he foreshadows for the gold-bearing districts of South Africa, in their capacity to add to the world's store of gold, is one that might quite naturally revive the alarmist theories started at the time of the Californian and Australian gold discoveries. Mr. DORSEY states that the Johannesburg district has been thoroughly worked and prospected for 30 miles in length, and fairly prospected for 60 miles more; and with the exceptions of a few faults (forming a very small percentage of the whole) the present development in uniform and continuous pay is over 25 miles long, with every prospect of being found to be much longer.

The so-called Main Reef is composed of four parallel veins within workable distance of each other, aggregating about 15 feet in thickness, and has been worked, as already mentioned, for 25 miles in length and to a depth of over 200 feet with uniformity in size and yield. The explanation of the small depth attained so far in the workings is the flatness of the veins, the beds being tilted up to an angle of 25 to 45 degrees.

The actual results from milling show that the average value of all the ore is about \$13.12 in free gold, and the present output from about 800 stamps now working is over 30,000 ounces per month, the last monthly return being nearly 33,000 ounces. Stamps are rapidly going up as development increases, and it is estimated that by the 1st of January next there will be at least 2,000 stamps dropping, with a monthly production of 75,000 ounces. It must be borne in mind that these returns are for one district alone, the principal one it is true, but there is already a production from others, and every day prospecting is going on farther afield with very promising results.

In connection with that part of his subject relating to net profits from this vast gold-bearing area, after stating that when the South Africans get settled down to steady work and have a few more facilities, now in progress, Mr. DORSEY says that each ton of ore should net \$10.

Some interesting figures comparing the richness of these gold fields with the ore of the great Treadwell lode in Alaska are given in an apparently official statement of the working of the Alaska Mining and Milling Company for the six months ending June 15, 1889. Tons crushed, 108,000; average yield per ton, \$3.80; average cost per ton of mining and milling, \$1.89; average net profit per ton, \$1.91.

One other point is worthy of mention. Most of the African mines are paying very high prices for their fuel, and yet Mr. DORSEY tells us that an inferior quality of coal is found in workable quantities within 200 yards of workings on the Main Reef, and it is very likely that ore and coal for fuel to crush it will yet come from the same shaft. As it is more than likely that with depth water would also be supplied from the same hole in the ground, we do not see what more could be asked for unless it were native quicksilver to amalgamate it with, or perhaps the metal ready coined to save all trouble. Mr. DORSEY is a very experienced engineer, but our own long service in the profes-

sion, as well as in editing the obituaries of experts' hopes, have weakened our faith in such marvelously good things, and if we owned the African gold fields we would be inclined to discount liberally these tremendous profits for prompt cash.

Neither can we altogether agree with the conclusions at the end of the paper that this large increase in the annual production of gold will materially change the relative value of gold and silver, unless there be a corresponding increase in the production of silver. This was the cry on the occasion of the two great gold discoveries of our time, and though it is true that, until facilities of communication are given, and regular channels of trade are opened up into the gold-producing regions, the precious metal loses its purchasing power locally to a certain degree, yet the appreciation of silver after the Californian and Australian discoveries combined was only from \$1.30 to \$1.34. The expansion of trade, colonizing enterprise and manufacturing industries increases in an equal or greater ratio than the additions to the world's supply of gold, and it is now, and is likely to be for some time, far short of the requirements of nations who are ambitious to place their transactions and currency on a gold basis. Although it is true that Queensland is also adding largely to the present gold production, and more than making up any deficiency from the other Australian colonies, her production for the past half year being £1,400,000, as against £1,590,000 for the whole of 1887, yet we need not be apprehensive that the increase in the silver production of the world will not be proportionate, if that is to be our safeguard. We do not see any indications of a decreased production in this country, but rather the contrary. In Mexico, Central and South America the tendency is toward a very decided increase of production, while even South Africa itself does not look as if it were going to be left out of the "procession" altogether. It is in Australia that the most striking increase has taken place, considering that prior to three years ago it was not a factor in the question. In the last three years the Barrier Ranges Silver field has added more than 11,000,000 ounces of silver to the world's stock, and in the next three years it would not be a matter of astonishment if Australia should supply 10,000,000 ounces a year.

NEW PUBLICATIONS.

TWENTY YEARS WITH THE INDICATOR. By Thomas Pray, Jr. 8vo., 285 pp. John Wiley & Sons, New York. Price, \$2.50.

This book is a reprint in one volume of two volumes formerly published under the same title. It is a practical book written by a practical man, using the word "practical" in its old sense as the opposite of theoretical. It does not contain a single formula or equation, and is written in a style which is supposed to be within the comprehension of the ordinary uneducated engine driver. It has no pretensions to literary merit, is full of colloquialisms, and has some grammatical errors, but these defects may be forgiven in view of the intrinsic merits of the work. It consists chiefly of a brief description of the Thompson indicator, and of the method of attaching it to engines, followed by eighty-four short lessons on indicator diagrams which the author has taken in his twenty years' experience as consulting engineer to steam users, or has obtained from his correspondents while he was connected with the Boston *Journal of Commerce*. Some hundred or more illustrations of diagrams are shown, covering every conceivable kind of badness that a diagram can have, and the faults of each are critically described. It is a book that will be appreciated by all intelligent working engineers, and all who need to have anything to do with a steam engine indicator.

A MINER'S GUIDE. By HENRY A. GORDON, Inspecting Engineer, Mines Department, New Zealand. Published by George Didsbury, Government Printer, Wellington, N. Z., 1889. Cloth, 8vo., 276 pp. (with a very complete table of contents, but no index). Price not stated.

Mr. Gordon has succeeded in getting together a mining treatise which is much better than the average of its class. This is rather faint praise, it is true, since such publications are often misleading unless studied and used with discretion, and by persons qualified by experience and observation to use them with judgment. In general the good points are the extremely practical tone; the adaptability to the needs of miners in the Australasian colonies, for whom it was especially prepared; the conservative manner in which Mr. Gordon discusses matters of theory; and the usually judicious selection of his reprint. Points which may fairly be criticised are: The absence of a more general handling of topics and citation of mineral occurrences, methods of mining, reducing and handling ores elsewhere, improved modern machinery, and many other matters which the New Zealand and Australian miners would be interested in knowing, in order to keep abreast of the times; and some slovenliness of style of composition and typographical make-up. These latter, however, are of small importance in a book which professes to be a practical manual, not a model of literary style.

The experts of the Australasian colonies have turned out much good and practical work. The geologists, engineers and chemists have ever kept in view the economic side, which is quite as scientific as "high science" itself; and they have done much to develop the resources of the colonies—which, by the way, the government experts of the antipodes are expressly paid for doing, and which they certainly do most creditably. The work of Daintree, Jack, Liversidge, Newbury, Wilkinson and many others has resulted in adding largely to the better literature of mining geology and of mining engineering.

The present volume will be of interest to American miners, for, although the modes of occurrence of gold placers and reefs (lodes) in New Zealand are not known to be common in this country, the very difference will be suggestive in prospecting. Again, with all deference to Mr. Gordon, while we think that our methods of overcoming extraordinary engineer-

ing difficulties are more original, daring and successful than those of the colonies, still we admit that there is something to learn from them in the way of economy, simplicity and straightforwardness. As to machinery and apparatus, the Australasian reports bear evidence that the miners down there would do well to consult our exporting manufacturers before putting up plant.

Mr. Gordon's geology is in the main fair, though inconclusive, since it is largely made up from reports, some quite old, of experts who have given their individual opinions, which do not always agree—as is the case in this part of the globe. His own remarks are conservative, and he points out that mining geology is but a new science, with a long and hopeful future ahead. It appears that the gold veins of New Zealand, as a rule, pinch out at a depth which seems shallow, for in this country there are many permanent veins running down to 2,000 feet and over, and a very large number of profitable gold quartz mines working at depths between 1,000 and 2,000 feet. The country seems to be more plicated and broken than in Victoria or here, resulting in much faulting and dislocation. A good deal of space is therefore given to the laws of faults and methods of recovering lost veins. The New Zealand deposits also seem to be unusually pockety. All over the world gold veins run in chutes, or at least the paying portions do, but the quartz or other gangue and filling are more continuous as a general thing. The New Zealand miners lean to the belief that the croppings and upper portions of gold veins are apt to be the richest parts, which is better than the idea often entertained in the West, that one must "get down on the lode" to find anything; once in a while the reason being given that since the deposits came from below—a thing by no means proved yet—down you must go to find the best ore. Probably the general state of things (though this is not at all absolute; arbitrary geology being absurd) is that just at the croppings the rock is richer because a sort of concentration has been going on *pari passu* with erosion and weathering; and of course green ore is found there, the base metals, sulphides, etc., having been in part leached away. As to the origin of ores and metalliferous deposits in general, the chances are that no single explanation will fit all cases. The conditions vary too greatly.

Mr. Gordon's mining methods are usually excellent. But when on page 56 he advocates starting a shaft on the foot-wall side he will have few to agree with him. There is a large diagram showing the vein, shaft and levels. We were looking for this, for mining books are full of illustrations of the kind. But one is surprised to find that Mr. Gordon does this deliberately and gives his reason; that the shaft, if put on the hanging-wall side, would cut the lode, getting into loose ground perhaps, and there might be loss of a little ore at the point of intersection if the shaft were supported by unbroken ground. Surely there cannot be many cases in which the ground is so bad that one would not dare cross it with a shaft and fear the possibility on keeping it plumb. Mr. Gordon's eighth level, 1,200 feet, with a 45-degree dip of lode, must of course be 1,200 feet long to connect. How would he like the system, at say, 3,000 feet? Our engineers generally plan to cut the lode, if it is supposed or known to be pretty regular in dip, at such a depth from the surface as to avoid loose ground; and it is well, in sinking with a definite hoisting power, to figure on meeting the lode at about the half-way point of the distance for which the engine power is planned.

The methods of sinking in gravel, sand and quicksand recommended are excellent, but no mention is made of the freezing process. All questions relating to damming back water in shafts and drifts are well treated. The chapter on blasting and explosives is a good one, but Mr. Gordon has let in some claims of patentees and manufacturers of explosives which are rather rash, and these are given a pseudo-authentic tone by the omission of crediting sources of information.

Under the heads of ventilation, water power and hydraulic working, hoisting, hauling, etc., many useful formulæ are quoted, but actual descriptions of machinery and of metallurgical methods are scarce. There is a long chapter on surveying, which looks as though it might be useful. Self-taught surveyors, however, do not succeed very well as a rule. W.

CORRESPONDENCE.

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

All letters should be addressed to the MANAGING EDITOR.

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

The La Noria Mining Company.

EDITORS ENGINEERING AND MINING JOURNAL:

SIR: I inclose you prospectus, report, etc., of the officers and directors of La Noria Mining Company, published June 5th, 1886, more than three years ago. The stock was then selling for three to three and a half dollars per share; it is to-day offered at one dollar and a quarter per share, with three-quarters of a dollar bid.

It might be interesting to read from the flowery prospectus, printed three years ago, by the managers then and now of the above company, just to learn what induced the thousand dupes in our city to invest our money in this great bubble, if not fraud. I remember of reading some years ago, in your valuable and reliable journal, some warnings on the subject, and had your advice been taken much of our lost money would have been saved.

It might be pertinent to inquire of the managers why they have failed, after four years, to publish a statement of La Noria's financial affairs, and why they still persist in withholding from the stockholders all information of the company's present condition. Some stockholders think they are entitled to know this, but perhaps they are mistaken.

"Oh! ever thus from childhood's hour."

Yours truly,

SCALPEL.

PITTSBURG, Pa., Oct. 1, 1889.

Miners' Superstitions.

EDITOR ENGINEERING AND MINING JOURNAL.

SIR: The JOURNAL of Aug. 31st contained an interesting article on the Maliwun tin mines of Siam, wherein reference was made to the "spirit" or "genius" of the mine, and to the disfavor with which he regards the intrusion of foreigners upon his subterranean domain—a lack of courtesy

that in many districts of China the representative "spirit" shows toward the whole human family, white, yellow, red or black. The most curious detail about it, however, is the "spirit's" predilection for showing himself in the form of a "hat," and the reason I insist upon the eccentricity of this especial metamorphosis is that in a mine, of which I was superintendent some years ago, in Mexico, we also had a "hat." I never saw it, to be sure; no white man ever did, and apparently it must have been too small to fit a Gringo's swelled head, and extinguish his six senses (only five of which he has in common with the native, for in that land of paradoxes what is a common sense with us is there a most uncommon one). But on the first level, and from above, this mysterious *rubber hat* descended through the hanging wall and fell like a huge extinguisher upon any native miner who happened to pass alone by the pump station. So firmly rooted was this superstition that the promise of ten pesos was powerless to induce Indian or Mexican to pass that spot alone. Its method of operating, as told by past and prospective victims, was as follows: The light went out suddenly and first, and in the darkness the gasping miner felt an impervious but soft and yielding bag close over him and bear him down. After a momentary struggle for breath he swooned away only to awake dazed and exhausted some considerable time later. I could discover no natural causes for this phenomenon, and, indeed, had I been less carried away by the story, I should never have sought for any, as what did not affect a white man ought not to affect a brown one. It is, nevertheless, a curious coincidence that at opposite ends of the earth's diameter there should be a mine with a "hat."

H. I.

Boston, September 28th.

[We think our correspondent has misunderstood the word "hat" in the text referred to. We take it to be the Siamese word for spirit or genius, and not a head covering.—Ed. E. & M. J.]

The Silver-Lead Ore Question.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: You will, I trust, permit me respectfully to point out what I deem to be some errors in the interesting letter addressed to you by Professor Rossiter W. Raymond on the question of the importation of silver ores containing lead, and published by you in your number of the 14th ult.

Professor Raymond puts his views with characteristic fairness, but his letter, I think, contains admissions which are fatal to the conclusion which he would draw. He substantially concedes that without what he and the advocates for a reversal call "lead ores," a very large proportion of American silver ores cannot be smelted. He says: "Thousands upon thousands of tons of such silver bearing ores" (that is ores containing silver and lead) "have been bought by the smelting works of Colorado at prices which involve a loss in smelting, because they were *lead ores*. No smelter ever knowingly paid a penny more than net value for the value of a *silver ore*. * * * He can get silver ores plenty (so-called dry ores), but without lead ores he cannot smelt them."

It seems to me that if these ores in dispute are paid for as a substance absolutely necessary in practice to permit the smelting of other silver ores, and if the price paid for such ores is, as Professor Raymond admits, in excess of the value of the lead which can be gotten out of the ores directly, not to speak of the value of the lead and silver combined—then, surely, whether or not these ores are for the sake of distinction in a general silver mining district known as "lead ores"—nothing can be clearer than that from a commercial standpoint the ores are not "lead ores." And it is from a commercial standpoint that the language of the tariff act, which is peculiarly an act regulating commerce, is to be judged. Prof. Raymond states the fact to be "unquestionable that the smelters of this country (and the same is true of all other countries) have always classed as lead ores those ores which contained enough lead to be used as the basis for smelting by the well-known 'lead process;' and that the silver in such ores has always been treated in the trade as an accessory constituent." Interrupting for a moment to point out the seeming absurdity that, where the silver in an ore is several times as valuable as the lead and all other constituents of the ore combined, although it may be much less in weight, the silver may still be only "an accessory constituent," I venture to point out some other conclusions which are just as direct, and which even Professor Raymond will admit to be no less sensible, but which are still conclusions that no sensible man would admit. Take the case of a silver ore carrying a large amount of iron (say, 50 per cent., more or less), and used in the very same "lead process" because of its richness in iron, and valued by the smelter "characteristically" for its iron. It is well known that smelters call such ores, irrespective of their silver contents or their lead contents, "iron ores." But are such ores "iron ores" in the sense in which that term is used in the Tariff Act? Are they "iron ores" in any other sense than as a convenient designation to distinguish them from other silver bearing ores? Would it not be at once perceived to be absurd for the Custom Houses to treat such ores as iron ores? So again Colorado smelters are very familiar with ores mined at Aspen and called "baryta ores." There are other ores called in Colorado, at the very center of the agitation for a reversal, "lime ores."

These ores are so called because they are rich in baryta or rich in lime. But they are none the less silver ores. Probably in transactions at Aspen, or elsewhere within Colorado, over such ores between smelters and miners, the ores may not once in a thousand times be alluded to as "silver ores." The ores will be distinguished as "iron ores," or "baryta ores," or "lime ores." And so are others of the ores distinguished as "lead ores;" but none the less all of these ores are silver ores.

Professor Raymond seems to overlook the fact that to tax the silver ores containing lead as "lead ores," simply because the lead preponderates in weight, means the exaction not only of a duty of a cent and a half per pound on lead, but also of a cent and a half per pound on the lime, rock, quartz, and whatever other substances may be in the ore; that is to say, a duty of \$30 would be exacted upon every ton of ore, with practically no regard to the lead contents. For instance, a ton of ore containing 25 per cent. lead would pay \$30 duty, or six cents for every pound of lead in the ore. But the duty on the finished lead is only two cents per pound. So that an ore with 10 per cent. or 15 per cent. or 25 per cent. of lead would pay as much duty as a ton of the clean

lead ore probably containing 75 per cent. of lead and over. It was with respect to ores of such a richness, being the ores then mined in Missouri, that the tariff was framed. The duty of a cent and a half a pound on ore, that is to say \$30 a ton, would be a duty of two cents a pound on the lead in an ore containing 75 per cent. of lead, which is the precise amount of duties on ores. Such were the ores known as "lead ores," mined within the United States and known to the framers of the present tariff; and such ores, and such ores only, did they intend to reach.

Whether the lead in ore should be taxed is a very different question. The copper in ore is taxed under the tariff; but a change in this direction with respect to lead is not competent to the Secretary of the Treasury to make; it can only be made by Congress.

In conclusion, I beg to say that I am well aware that your journal is peculiarly solicitous with regard to the interests of American mining industry, and I cannot but think that you have performed a great service in pointing out that the exclusion of Mexican ores means reduction in price to the miners of the great mass of American silver ores. Precisely as the price of ores containing lead and useful in smelting is raised to the producers of dry ores, so will the price which they can obtain for their dry ores diminish. For the greater the cost of the fluxing ores or coal or lime to the smelters, the less their payment to the miners of dry ores. The real question in this whole controversy is not so much between the importers of Mexican ores on the one hand and the owners of the carbonate mines in Colorado on the other, as it is between the owners of those carbonate mines on the one side and the vast majority of the American producers of silver ores on the other. My own personal interest as a smelter is clearly involved in the prosperity and in the increasing product of American silver ores suitable for smelting.

Very respectfully yours,

AUGUST R. MEYER.

RYE BEACH, N. H., September 20th 1889.

AMERICAN INSTITUTE OF MINING ENGINEERS—OTTAWA MEETING.

From our Special Correspondent.

The meeting of the American Institute of Mining Engineers at Ottawa, October 1st and 3d, was an occasion of international importance, and it was evident that our Canadian neighbors fully appreciated it as such from the liberal governmental appropriations, as well as the unstinted hospitality which characterized this meeting equally with that of the American Association for the Advancement of Science, at Toronto a month ago, at which meeting the concluding vote of thanks very truly stated that the social attractions of the meeting had never been surpassed in the history of the association.

The place of meeting was the Railway Committee room, House of Commons. On Tuesday evening, Dr. Sweetland, chairman of the local committee, presided, and, on behalf of the local committee, welcomed the Institute to Ottawa.

Sir John Macdonald, following Dr. Sweetland, remarked that, as a citizen of Ottawa, he joined in giving to the engineers a hearty welcome. The Institute had honored Canada on previous occasions with a visit, and he hoped that their visit to the metropolis—which was still an infant metropolis—of Canada would induce them to come again. He said that "the intercourse between the people of Canada and you, gentlemen, representing very important bodies in the United States, will tend still further to unite us in feeling, as we are in blood, language and otherwise."

Sir John next told a story which brought out a hearty laugh all round. It was related to him, he said, by a Canadian of American birth, who in traveling east from Windsor sat in the railway car behind two American gentlemen. One of the American gentlemen observed after they had journeyed a few miles from Windsor, "Not a bad country, eh?" to which the other replied, "Not bad." After journeying a few miles further the first speaker observed, "A good country;" and finally, after going a few miles further, said, "Fine country; we must have this country," to which his companion replied, "I have no objection to take the country, only for the damned people in it."

The American people, Sir John continued, were beginning to think that Canada was not far behind other portions of the continent. He could not speak as a miner, as he was more of a politician, but his opponents were not very backward in saying that he and his party were underminers—(laughter)—an imputation which he stoutly denied. He wound up by relating what the profane Sheridan said at Manchester, when he gave a toast at a meeting similar to the present one. Sheridan's toast was: "Dam your rivers, sink your mines and blast your canals." Sir John again welcomed the visitors and resumed his seat amidst applause.

Hon. David A. Ross, of the Quebec government, spoke of the obligations Canada was under to the men who built her railways as well as to those who developed her mines, and although he did not consider the geologists and engineers of Canada inferior to any others, still much was to be gained by a gathering of prominent engineers from the whole country. He urged a visit to Quebec, where the Premier Mercier was anxious to greet them.

In the absence of the Mayor, Alderman Henderson spoke on behalf of the municipal authorities. He apologized for the disagreeable weather, with the hope that the heartiness of their welcome would make up for it. He tendered a specially hearty welcome to the strangers—strangers in one sense, but not in another. We could all boast of a common origin, and a common mission to elevate, to ennoble, and to assist our fellow-men.

Then the United States Consul Col. Richard Lay said that speech-making was forbidden by consular rules, hence he would content himself with bidding the delegates welcome, and assuring them they would find much of interest here.

John M. Garland, president of the Board of Trade, read an address of welcome to the members, not merely as members of the Institute, but as "gentlemen coming from a country in whose progress and prosperity we take the greatest interest, and with which we are desirous of always having the closest social intercourse, as well as such commercial relations as will be eventually advantageous to countries raising products which it is their interest to exchange on the fairest possible terms."

Mr. Thomas Egleston of New York, vice-president of the Institute, replied in the absence of the president, remarking that the American Mining Engineers were not unknown to Canadians. Many of them have

very near and dear friends on this side of the border, and they know the Canadian hospitality. They have been in this country before and know what hospitality they are to receive, and what objects to see in this fair land. They cannot boast in their own country any such ride as that over the C. P. R.

Dr. Raymond then made what the *Free Press* truly characterizes as "an eloquent speech," returning thanks on behalf of the Institute.

Vice-President Egleston took the chair, and biographical notices were read as follows:

Dr. George Cook, geologist, of New Jersey, by Professor Smock; Wm. H. Scranton, of New Jersey, by Dr. Raymond; Captain Jones, of Pittsburg, who died last Saturday from the effects of a furnace explosion: sketch read by Mr. Ashford.

The next morning was devoted to a carriage drive. Fortunately the day was fair. If the drive had been delayed a day it would have been made in the snow and rain. The falls of the Chaudière were visited, and several of the large mills, including Eddy's, Perley & Pattee's and Pierce's.

Thence the party drove to the Experimental Farm, and were received, in the absence of director Saunders, by Messrs. Shutt & Fletcher.

At the afternoon session, the first paper was read by Dr. Robert W. Ellis, of Ottawa. It was on "The Mining Industries of Eastern Quebec."

Charles A. Ashburner, of Pittsburg, read a paper on "Natural Gas Explorations in the Ontario Peninsula." Natural gas has been found more or less for twenty years, but the first borings were made in 1880. Probably there will never be enough found near Quebec or Montreal to be utilized for heating or even illumination.

Dr. Raymond stated that the subject has been very ably summed up by

acquired, for his leisure from the farm duties was devoted to study. As he grew older the profession of civil engineering attracted him, for in those days railroad building offered great inducements to those who engaged in it, and so young Cook, in 1836, when he was but a little over eighteen years old, served on the laying out of the Morris & Essex Railroad, but the company failed, and he never received any pay. He then engaged in the surveying of the Catskill & Canajoharie Railroad.

Feeling the need of a better scientific education, he entered the Rensselaer Polytechnic Institute in December, 1838, and was graduated there a year later with the degree of C. E. He then devoted himself to teaching, and for nearly two years was so occupied, but in May, 1840, he returned to the Institute as a student, receiving the additional degrees of B. N. S. and M. S., and also acted as tutor. In October of that year he was made adjunct professor, and in May, 1842, senior professor, teaching the branches of geology and civil engineering. Four years later he entered business life in Albany, and until July, 1848, he was engaged in the manufacture of glass. He then became professor of mathematics in the Albany Academy, of which institution he was made principal in 1851.

His success in that capacity led to his being called to the chair of chemistry and natural philosophy at Rutgers College, in New Brunswick, N. J., in 1853, and thereafter he continued his relations with that college until his death. The exact title of his chair was changed several times, becoming in 1878 that of chemistry, geology and agriculture, and later he relinquished the chemistry but retained the charge of the geology and agriculture. In 1864, through his influence, the New Jersey State College for the Promotion of Agriculture and the Mechanic Arts became attached to Rutgers, and, still retaining his chair, he was elevated to the rank of vice-president of the combined institutions.



GEORGE HAMMELL COOK.

Professor Herfurth, who unqualifiedly adopts the theory that the origin of petroleum is *animal* remains. He takes substantially the same view as Leslie and Newberry, although the origin of coal cannot be animal, unless in rare instances.

Professor Ashburner added that the origin of oil and gas in the carboniferous and lower Silurian is mainly animal, that of Devonian is vegetable. The California oils and gases are mainly animal.

Messrs. Macfarlane, Leckie and others continued the discussion.

The evening was devoted to a social entertainment given by the local committee at the Russell House, which was a full-dress affair, and very successful.

GEORGE HAMMELL COOK, STATE GEOLOGIST OF NEW JERSEY.

The present development of the mining industries of the United States is perhaps due more than any thing else to the admirable systems of geological surveys, both national and State, that prevail over this country. One of the earliest of these was that of the State of New York. Its existence dates from 1836 and its direction was intrusted chiefly to those who were connected with the Rensselaer Polytechnic Institute, and the present director, James Hall, was long a member of that famous school. Henry D. Rogers, the third of the famous four brothers, began the first geological survey of Pennsylvania at about the same time, and it has since been guided by J. Peter Lesley. Between New York and Pennsylvania is New Jersey, and the influence of these two larger surveys naturally made itself felt upon that of the smaller State. The work accomplished by the geological survey of New Jersey has been of the highest character and it has been valued accordingly. Its director was a graduate of the Rensselaer Polytechnic Institute and for nearly forty years was engaged on its work.

Professor Cook was born in Hanover, N. J., on January 5th, 1818. His early education was received at the village school, and in part was self-

Professor Cook is, however, best known in connection with his work on the geological survey. In 1854 he was appointed assistant geologist for the State of New Jersey, a place which he held for three years, during which time he showed great activity in developing the mineral resources of the State. During that period he published "Annual Reports on the Geological Survey of the State of New Jersey" for the years 1854, 1855, and 1856, also a "Geology of the County of Cape May" (Trenton, 1857). The office of State Geologist was then allowed to lapse for several years, but in 1864 Professor Cook presented a paper before the State Legislature setting forth the value of that undertaking so ably that a bill was passed reorganizing the survey, and he was made State Geologist. Since that time he has had the active management of that important work. Various economical problems have been taken up and studied under his guidance. One of the most valuable of them was the consideration of the clays of New Jersey and their application to uses for pottery, which proved of great service to those engaged in that industry. Another was a very complete study of the flora of New Jersey, accomplished for the survey by Dr. N. L. Britton. The maps relating to geological formations, water sheds, mineral deposits, etc., constructed under his supervision, are said by competent judges to be the best of all those published by the different States of the Union. This fact was corroborated by the leading officers of the United States Geological Survey, who united in expressing their admiration of them, and assured him that they would in future be used as models for such work. The published annual reports of the work accomplished by the survey from 1864 till 1888, and also a volume of 900 pages on the "Geology of New Jersey" (Newark, 1868), with an "Atlas" of eight maps. At the time of his death he had a second volume on the subject about finished. Professor Cook was active in the formation of the New Jersey Board of Agriculture, and was its secretary until 1879. During his administration of this office he issued five annual reports. He continued his interest in the work, however, and was a member of the executive committee until his death.

In 1886 he organized the New Jersey State Weather Service and became its chief director. He was an active member of the Board of Water Commissioners of New Brunswick for more than fifteen years, and during part of that time was its president; also he served as a member of the State Board of Health.

In 1852 Professor Cook was sent to Europe to make investigations tending to aid the development of the Salt Springs of Onondaga by the State of New York. He again visited Europe in 1870, and in 1878 he went as a delegate to the International Geological Congress, held in Paris in connection with the World's Fair of that year.

The degree of Ph. D. was conferred on him by the University of the City of New York, and later he received that of LL.D. from Union College. He was a member of the Royal Agricultural Society of Sweden, and in this country was an early member of the American Association for the Advancement of Science, of which he was vice-president in 1887. He was likewise a member of the American Philosophical Society and of the Academy of Natural Sciences of Philadelphia, also a member of the American Institute of Mining Engineers. In 1887, he was chosen a member of the National Academy of Sciences, an honor well deserved, and one which unfortunately he was only able to enjoy but for a short while.

His death was somewhat sudden. He was taken ill in the college laboratory on September 21st, and though at first his case was not considered serious he died on Sunday, the day following, of angina pectoris.

In his death New Jersey loses one of her most eminent sons and perhaps her most distinguished scientific representative, for no one did more in order to instruct the people in the application of science for the enlargement of their practical knowledge and the increase of this prosperity than Professor Cook.

How Slate Pencils are Manufactured.—One of the most peculiar branches of industry in this country is the manufacture of slate pencils.



PLATE I.—ESSEX-MERRIMACK BRIDGE. 1792.

There is only one slate-pencil factory in the United States. It is located at Castleton, Vt., and employs twenty-five hands, who turn out 30,000 slate pencils every day. The method of manufacture is a good deal in advance of the primitive means employed some years back. Not long since the blocks of soft slate from which they are cut were sawed in lengths and distributed among the neighboring laborers' families to be whittled down to pencil shape. Those working at them could earn about fifty cents per thousand. By the present system the blocks, which are as wide as a pencil is long, are put into the mouth of a machine called the crocodile. This contains six rows of revolving curved knives. As the slab passes between these knives paralleled grooves are cut in the slabs, then they are turned and cut through. The square pencils are then rounded and polished by holding them against the emery belt. One man can cut out and finish about 8,000 pencils per day.

The Russian Petroleum Supply.—According to the Baku correspondent of the *Chemiker Zeitung*, a crisis in the Russian petroleum industry is rapidly approaching, owing to the exhaustion of the springs on the Caspian shore. At the present moment, says the correspondent, the springs are drying up with alarming rapidity, and the new borings yield very little indeed. Nearly all the refineries in Baku, including the large works of the firm of Nobel, are suffering greatly from the want of raw material, the price of which has quintupled within a short time. Occasionally the new borings tap a fresh supply, but all these fresh springs dry up after one or two days. Messrs. Nobel have had to turn to Bibiebat, a place considerably removed from their works, but where the oil is still running freely, for the requisite supply, and the representative of the Rothschild interest at Baku has been suddenly called away to headquarters in Paris to discuss the situation. Besides the Baku region petroleum springs are found all through the Caucasus, but they have never been properly surveyed, and a cessation of the supply at the headquarters of the industry would be little short of a disaster to the whole of the Russian empire.

AMERICAN RAILROAD BRIDGES.

By Theodore Cooper, M. Am. Soc. C. E.*

The existing and the accepted types of bridges in use to-day on American railroads being the results of a true evolution, no attempt to present them intelligently would be complete without a brief sketch of the past history of bridges in America.

The rapid development of the new world, and the enormous number of bridges that has been built within the limits of the nineteenth century, have furnished us with a wide experience, from which we have been able to select the good and reject much that was bad or undesirable.

The pioneer life, not only of the earlier settlers, but of each generation to the present day, has developed to a high degree the energies, ingenuity and self-reliance of the American people. These pioneers were compelled to be men of all trades. Their limited resources and the lack of time or opportunity to seek for past precedents impelled them to solve each problem anew. They "thought with vigor and were not fettered with the trammels of science, before they were capable of exerting their mental faculties to advantage," as Sir Joseph Banks wrote to Thomas Paine in 1788.

Having no educated "lines of least resistance," they were better able to solve the many problems before them by new and novel methods.

The bridging of small streams was a part of the pioneers' labor. The crossing of the larger rivers developed specially gifted men, like Timothy Palmer, Theodore Burr, Lewis Wernwag, and others less well known, who built timber bridges that are looked upon as wonderful structures, even to the present day. The records of the early bridges of America are very incomplete, but enough remains to show what admirable work these early bridge builders could do.

1. WOODEN BRIDGES.

The earliest bridges, where single timbers were not sufficient to stretch

from bank to bank, were short spans supported on piles, or, where these could not be used, on timber cribs filled with stone. Where the conditions would not allow of structures of this character, arch spans were usually adopted.

In 1660 "The Great Bridge," as it was then called, was built across Charles River, between Old Cambridge and Brighton. It was a pile bridge.

In 1761 Samuel Sewall planned and built a bridge over York River, Maine, 270 feet long, supported on 13 piers. Rebuilt in 1793.

In 1786 Mr. Sewall built a bridge over the Charles River, at Boston, 1,503 feet long, supported on 75 piers. A year or so later bridges on the same plan were built at Malden and Beverly, Mass.

In 1792 Col. William P. Riddle built the Amoskeag Bridge at Manchester, N. H. It was 556 feet long, and supported on five piers and two abutments. It was commenced on the 3d of August, "at which time the timber was growing, and the rocks dispersed in the river," and completed on September 29th.

Between 1785-92 Col. Enoch Hale built over the Connecticut River, at Bellows Falls, a bridge 368 feet long, in two spans, taking advantage of a rock in the middle of the river for his center-pier. The West Boston Bridge over the Charles River, 3,583 feet long, and supported on 180 pile bents, was finished in 1793.

Near the end of the eighteenth century a bridge was built over Cayuga Lake, N. Y. It was a pile bridge in 25-foot spans, one mile in length.

In 1795 a bridge was built over the Mohawk River, 960 feet long, supported on 13 piers.

In 1792 Timothy Palmer built the Essex-Merrimack Bridge over the Merrimack River at Deer Island, about three miles above Newburyport, Mass. It consists of two bridges resting on Deer Island in the midst of the river (Plate I). "An arch of 160 feet span and 40 feet above the

* Transactions of the American Society of Civil Engineers.

level of high water connects this island with the mainland on one side; the channel on the other side is wider, but the center arch is but 113 feet." That part of the bridge on the Newbury side, the 160-foot span, was removed in 1810 and replaced by a chain suspension bridge. The

loaded wagon drawn by four oxen and one horse. The bridge was again rebuilt, and is still in use. The bridge, as it now exists, consists of two independent roadways, each 15 feet 6 inches wide. Each roadway is supported on two sets of chain cables, each set being composed of three



PLATE II.—ESSEX-MERRIMACK BRIDGE. 1810.

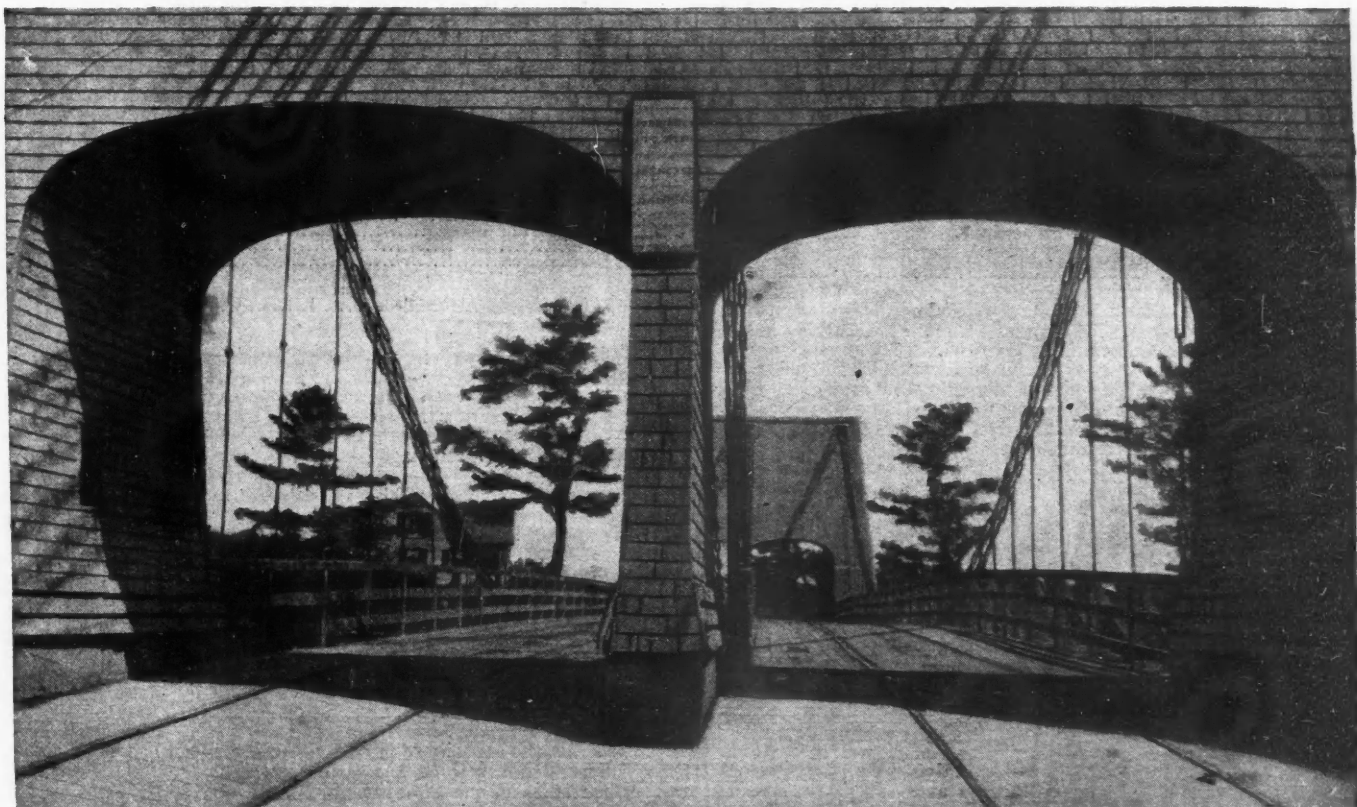


PLATE III.—ESSEX-MERRIMACK BRIDGE. 1810.

part on the Salisbury side remained until 1883. The chain bridge was built by John Templeman, of the District of Columbia. "It was the first chain bridge built in New England." Its span is 244 feet between bearings on towers; the towers are timber frames covered with boards and shingles. February 6th, 1827, one of the chains broke under a heavily

chains. These chains seem to have been repaired in many places with different sized links. The chains generally are formed of links about 2 feet long, made of 1-inch square iron. For about 6 feet over the bearings on the towers each chain is spliced or replaced by three smaller chains with links about 1 foot long, and of about 1/4-inch square iron. The floor

is hung from these chains every 7 feet by suspenders, formed indifferently of bars 1 inch square, straps $2 \times \frac{1}{4}$ inch, or pieces of chains (Plates II. and III.)

In 1793 Timothy Palmer built another bridge over the same river at Andover. Rebuilt in 1803.

In 1794 he built the Piscataqua Bridge, seven miles above Portsmouth, N. H. It was 2,362 feet long. The greater part consisted of pile work.

"But that part which engages the attention of travelers is an arc nearly in the center of the river, uniting two islands over water 46 feet deep. This stupendous arc of 244 feet chord is allowed to be a masterly piece of architecture, planned and built by the ingenious Timothy Palmer, of Newburyport, Mass."

"The chord of this arch is 244 feet 6 inches. The versine of the arch was 27 feet and 4 inches, and depth of the frame-work of the arch 18 feet and 3 inches. There are three concentric ribs, the middle one carrying the floor of the bridge; they were selected from crooked timbers, so that the fiber might run nearly in the direction of the curves, and are connected together by pieces of hard and incompressible wood, with wedges driven between, the ribs being mortised to receive them; thus the ribs are kept at a regular and parallel distance from each other. Each rib is formed of two pieces laid side by side about 15 feet in length; they are all disposed in such a manner as to break joints, the end of one timber coming in the middle of the length of the other which is near it; their ends all abut with a square joint against each other and are neither scarfed nor mortised, the two pieces of timber being held together by transverse dovetail keys and joints; all the timbers are admirably jointed and freely exposed to the action of the air; any piece may also be removed in case of its requiring separation without injury to the rest of the structure."

The bridge was 38 feet wide and had three arched trusses. Another description states that the second rib carrying the floor of the bridge was of a larger radius than the lower to facilitate the traveling; the upper rib served for a railing.

In 1794 the bridge at Haverhill was built by Timothy Palmer, "contemporaneous with the first stage coach and the first newspaper." It consisted of three arches of 180 feet; each is supported on three handsome piers 40 feet square; it had as many defensive piers or sterlings extending 50 feet above and a draw 30 feet over the channel.

In 1796 he built a bridge over the Potomac River at Georgetown.

In 1796 Rufus Graves built a bridge over the Connecticut River at Hanover, N. H., consisting of a single arch of 236 feet. He patterned his bridge after the Piscataqua Bridge built by Palmer. The roadway followed the line of the arch and was some 20 feet higher at the center than at the abutments. The bridge was formed of the largest selected white pine, hewed to 18 inches square, some of them 60 feet long. This bridge fell in 1804, without warning, and by its own weight; its destruction being hastened by the undermining of one of the abutments, through deficient waterway. The builder of this bridge studied divinity, graduated at Dartmouth College, became a merchant, then a bridge builder, then an officer of the United States Army, and finally a physician.

In 1795 a bridge was erected at Holt's Rock, between Newbury and Haverhill. It was 1,000 feet in length and consisted of four arches and one draw-span. It was carried away by the ice in 1818.

In 1796 a bridge was built between Harlem and Morrisania, over the Harlem River.

About the end of the last century a bridge was built at Windsor, Vt., with two spans of 144 feet, and one at Romley, Mass., consisting of 8 arches, of a total length of 870 feet; one at Howland's Ferry, R. I., 900 feet long, with a sliding draw, supported on 42 pile bents, and the Weybasset bridge, at Providence, R. I., "160 feet long, supported by two wooden trestles and two stone pillars."

There were also two bridges over the Lehigh River, one at Bethlehem and one at Easton.

These are the records as I have been able to gather them of bridges of any importance built in the eighteenth century.

From 1804 to 1806 "The Permanent Bridge" over the Schuylkill River at Philadelphia was built. It consisted of two arches of 150 feet clear and one of 195 feet clear.

"The plan was furnished by Mr. Timothy Palmer, of Newburyport, Mass., a self-taught architect. He brought with him Mr. Carr as his second and four other workmen from New England. They at once evinced superior intelligence and adroitness in a business which was found to be a peculiar art, acquired by habits not promptly gained by even good workmen in other branches of framing in wood." "The frame is a masterly piece of workmanship, combining in its principles that of king post and braces or trusses with those of a stone arch."

There were three truss and arch frames. The timber was of the best white pine. Width of the bridge, 42 feet. The bridge was covered and closed in from the weather. Mr. Palmer stated that from his experience wooden bridges uncovered would become unsafe in ten to twelve years.

"I am an advocate for weather boarding and roofing, although there are some who say it argues much against my own interests; notwithstanding I am determined to give my opinion as appears to be right. It is sincerely my opinion that the Schuylkill Bridge will last thirty and perhaps forty years if well covered. You will excuse me in saying that I think it would be sporting with property, to suffer this beautiful piece of architecture (as you are sometimes pleased to call it), which has been built at so great expense and danger, to fall into ruin in ten or twelve years."

(TO BE CONTINUED.)

Formation of Nitre Deposits.—Caves containing deposits of earth with from 4 to 30 per cent. of calcium nitrate and 5 to 60 per cent. of calcium phosphate are common in Venezuela, not only in the littoral mountain chains, but also on the flanks of the Cordillera of the Andes. In these deposits are embedded remains of mammalian bones, preserving their form, but so friable as to fall to powder when they are extracted. They consist solely of calcium phosphate; the gelatin has been nitrified and dissolved out, and the calcium carbonate of the bone has been used up in neutralizing the nitric acid produced. The nitric ferment is found in abundance throughout the deposits in a very well developed form. Some of these deposits are 10 metres thick.—*Jour. Soc. Chem. Ind.*

OFFICIAL REPORTS.

THE BROKEN HILL PROPRIETARY COMPANY, LIMITED.

The following extracts from the Directors', General Manager's and Head Metallurgist's reports to the stockholders of the Broken Hill Proprietary Company will, with the accompanying plan of the underground workings, fairly explain the position of the company, financially and otherwise:

"Your directors have great pleasure in submitting their eighth half-yearly report on the proceedings of the company, together with the usual balance sheet and statements of account for the past six months.

Refinery at Port Pirie.—This work is progressing satisfactorily, although some considerable delay has been occasioned by the late severe rains. Your directors have been prosecuting inquiries in India, China, and Japan as to the disposal of the company's refined products, and they are indebted to Mr. W. R. Wilson, one of your directors at present in England, who, during his recent visit to China and Japan, has obtained much valuable information and established correspondents in important centers in those countries.

Concentration or Ore-dressing Plant.—Your directors have much satisfaction in announcing to shareholders that this important addition to the company's plant is performing the work expected satisfactorily; one-half of the plant is now in regular operation, and the whole of it is expected to be working shortly. The services of Mr. Holley, who is in charge under the general manager, have been secured for a further 12 months, and an arrangement has been agreed to by which the expenses of his salary are shared equally by the British and Block 14 companies, who have similar plants to the one belonging to this company also approaching completion.

Tramway Siding.—This important work, undertaken at the joint cost of Block 14, the British, Block 10, and this company, has now been completed and all costs and charges paid. A joint agreement is being prepared defining the running powers and the maintenance payable by each company.

Contract for Carriage of Bullion.—The contract with Lunn's line of steamers having terminated on the 31st of May last, your directors, previous to that date, invited tenders for the transport of the company's bullion to London, and accepted the joint tender of the Peninsular & Oriental and Orient Steam Navigation Companies at a satisfactory rate. This company thus secures a regular weekly delivery of its bullion in London, which is a most important consideration when such large quantities have to be handled and placed upon the home market.

Mine Timber.—The necessary consumption of mine timber is now very large, and important contracts for the supply of Oregon as well as for New Zealand and Tasmanian hardwood have been entered into. Oregon timber is lighter in weight, and is found to be less expensive in final cost, in consequence of the lesser rail carriage chargeable thereon from Port Pirie to the mine.

Coke.—Adequate arrangements are made for the regular supply of the best English brands of coke. So far the colonial supply has been insufficient, and the quality generally is not satisfactory for the company's requirements.

Smelting Furnaces.—The ninth furnace is now in full use, and your directors have, under advice of the general manager, decided to erect another (No. 10) of the larger size. Those in use continue to do excellent work and the plant throughout is in first-class order.

Financial.—During the half-year £240,000 has been distributed in dividends, paid monthly, being equal to 30s. per share of £2 each, and your directors expect to immediately announce a satisfactory increase in that direction. The amount of £40,862 1s. 5d. has been spent on construction account, and at the close of the half year, after providing for all outstanding liabilities, there are surplus assets in cash, stores and bullion on hand representing a value of £100,431 5s. 5d., made up as follows:

Coke.....	£25,206	15	0
Mine timber and stores.....	15,874	12	4
Bullion.....	5,000	0	0
Cash in hand.....	80,208	1	1
	£126,289	8	5
Less outstanding liabilities.....	25,858	3	0
	£100,431	5	5

In conclusion your directors would draw attention to the concluding remarks in Mr. Patton's report—"The immense development in high-grade carbonate ore in MacGregor shaft on the 230-foot level has added to our resources, notwithstanding the extraction of over 67,000 tons during the last half year."

Mr. Patton, the general manager, in his report, says, under the head of furnaces:

"Our furnaces have been making remarkable runs during the past six months, each one only losing about seven days in that time.

"The report of Mr. Schlapp, your metallurgist, gives each week's run in detail, besides the actual stoppages made during the half year of each respective furnace, with other interesting matter in detail. The new 80-ton furnace, No. IX., has been in continual blast since it was blown in, and has proved a valuable addition to your reducing plant.

Ore-dressing Plant.—This department is now in a fair way toward completion. During the early part of last half year the illness and enforced absence of Mr. Holley prevented it from being pushed on as rapidly as was anticipated. At the present time one-half the plant has been in operation, running "trial trips" only, and the results obtained undoubtedly prove its effectiveness.

By increasing the capacity of our circulating pumps it has been found that much less water will be lost than was anticipated in dressing our ores. This result will enable us to increase our ore-dressing capacity, if required.

I anticipate during July to have the complete plant in full operation at a capacity of about 300 tons per day.

Refinery (Port Pirie).—The progress of this work has been much impeded by the heavy rains which have occurred, but doubtless as more settled weather obtains this difficulty will be obviated.

The greater part of the masonry and buildings are well in hand.

General.—During the past six months there has been extracted from the mine 67,741 net tons of ore, yielding 2,677,686 ounces silver and 11,418

tons of lead, or an average of 17 per cent. lead and 39.38 ounces of silver per ton of ore treated. This ore has been mined and put into our surface bins (including all dead work) at an expense of £1 1s. 8d. per gross ton, and the cost of smelting during the past six months has been at the rate of £1 13s. 10d. per ton.

The ventilation of the mine has been so improved that no difficulty is experienced in working our lead stopes.

Our construction account continues heavy, but the near completion of our ore-dressing and refinery plants will materially reduce this class of expenditure during the next six months.

The results attained make it unnecessary to draw attention to the efficient manner in which the business of the several departments of this mine have been carried on by their respective heads and their assistants.

The explorations in depth on Block 11, and the developments in the main shaft of the Broken Hill Central Silver Mining Company, Limited, seem to indicate the existence of a channel of oxidized ore, much below what has heretofore been regarded as the dividing line between the carbonate and sulphide ores. This seems to extend from Jamieson's shaft

£585,897 12s. 8d., being a value per ton of ore of £8 11s., while the total expenses, including depreciation, amounted to £293,172 4s. 10d., or an average cost per ton of ore treated of £4 5s. 7d.

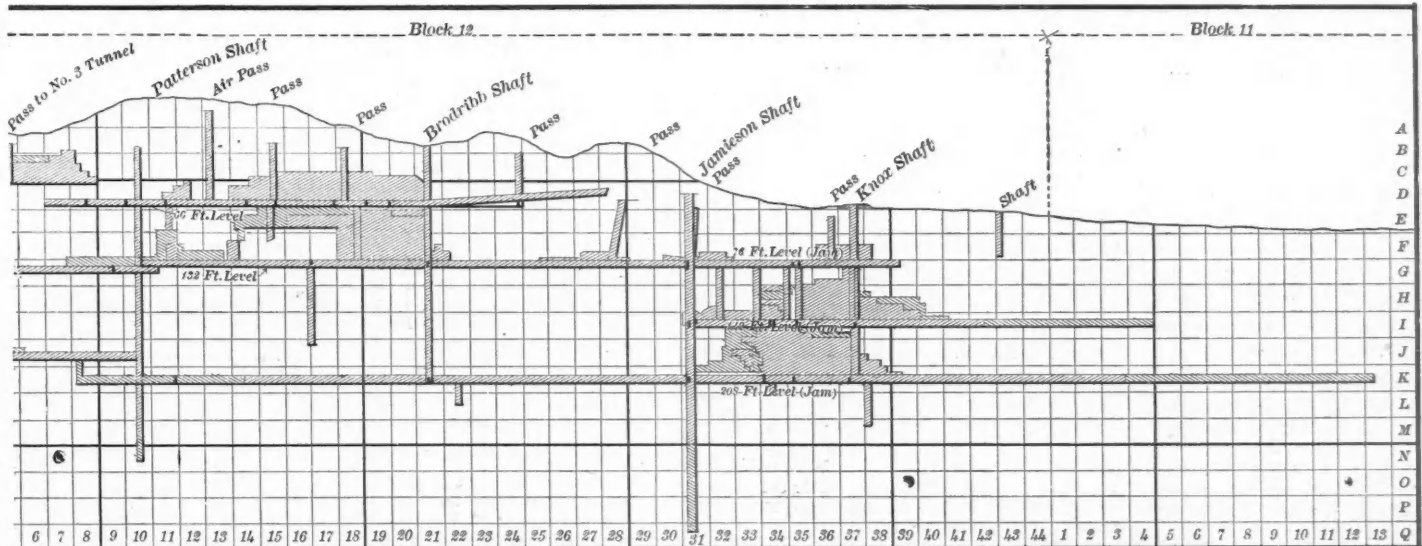
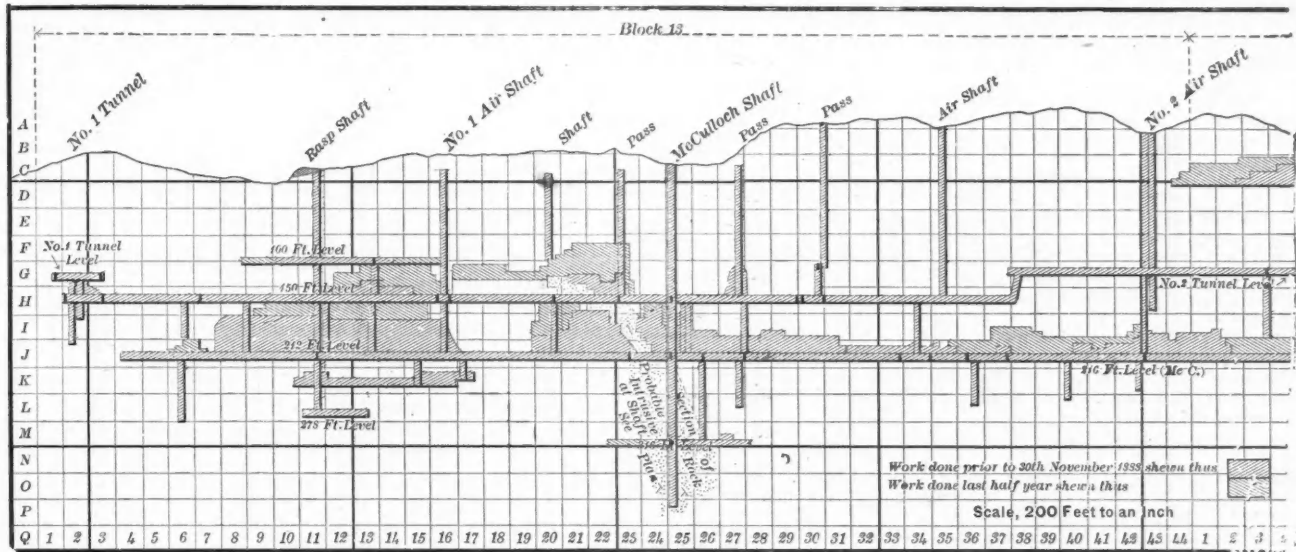
THE USE OF ELECTRICITY IN MINES.*

By Chalon, C. E.

Translated for the ENGINEERING AND MINING JOURNAL

The applications of electricity to underground work are becoming so numerous that it is possible to predict that in the near future the electric current will be used nearly everywhere in place of mechanical power.

Even in coal mines, which are now so admirably equipped with mechanical appliances on account of the economy necessary in order to sell their output, steam, compressed air and water under pressure are being slowly replaced by the electric current, because the latter is so easily transported, is so economical, is not dangerous, and by the use of a simple copper wire may be directed to any depth or level of the mine.



UNDERGROUND WORKINGS OF THE BROKEN HILL MINE.

in a southerly direction through Block 11, and will no doubt be confirmed by the explorations carried out during the next six months."

The metallurgist, Mr. H. H. Schlapp, reports: 71,055 gross tons ore, 15,866 tons limestone, 11,400 tons coke consumed during the half year, with a product of 11,418 tons of lead and 2,677,686 ounces of silver.

"The amount of flue-dust treated during the half year was 804 tons, containing 241 tons lead and 8,040 ounces silver. Deducting this amount from the totals of the above table, leaves 70,162 gross tons, equals 67,741 net tons of ore as the amount of ore actually treated. This gives an average production of 17 per cent. lead and 39.38 ounces of silver per net ton of ore.

Ores.—The ore treated was made up of the following quantities of the different classes of ore: Lead ore, 33,092 tons net, 48½ per cent.; silicious iron and kaolin ore, 28,941 tons net, 43 per cent.; iron ore, 5,708 tons net, 8½ per cent.

Cost of Smelting.—Labor directly about the furnace, 5s. 7d.; engineers, firemen and fitters, 9d.; general labor, 10d.; total labor, 7s. 2d. Superintendence and assay office, 6d.; limestone, 5s. 8d.; coke, 18s. 5d.; firewood and coal, 1s. 5d.; repairs and horses, 8d. Total cost per net ton of ore, bullion delivered on trucks at Broken Hill, 33s. 10d., or \$8.44."

The number of men and boys employed by the company was 2,127. The total gross value of the half year's product sold in London was

Such a current may be used for work of the most diverse character. It may be employed for lighting at the bottom of the mine, and at the same time for a similar purpose on the surface, and for the communication by signals and for the telephone. It will furnish at any depth, at different levels, and at various distances, the motive force for underground haulage, by cable or inclined planes; for the removal of material thrown down by blasting; for pumping water; for ventilation; for drilling; for coal cutters, and, indeed, for running motors and machines of all kinds.

All these many applications require only a dynamo run by a steam engine and conducting wires.

It is in metalliferous mines that the application of electricity is becoming most valuable. Such mines usually possess many disadvantageous conditions for working, because they are almost always situated in districts that are not easily accessible, where fuel is expensive, and where transportation is an almost insurmountable difficulty. In such cases there is usually in the vicinity some water-fall, a swift river, or even a simple stream, whence the natural power may be transformed by the aid of a turbine, or an impact wheel and a dynamo, into currents of electricity which may be used for lighting, for the breaking and transportation of the ore, and even for the treatment of the ore at the mine by electrolysis

*A report presented at the request of the Committee on Organization to the International Congress of Mines and Metallurgy, held in Paris, September, 1889.

or heat. In some cases it is possible to sink an artesian well to produce an artificial water-fall by means of a reservoir more or less elevated.

Indeed, it is possible to predict that the time is not far distant when it will be possible to work all mines with profit, especially those which from their inaccessibility have been thus far allowed to remain unproductive.

In point of number and variety of applications of electricity for mines, the United States has for some time shown greater advance than other nations, and large establishments have grown into existence for the manufacture of electrical appliances, and the practical knowledge gained in them has contributed largely toward the development of the use of electricity in underground workings.

The Firing of Blasts by Electricity.—The use of the electric current for igniting charges of powder is perhaps the oldest application of electricity in mines. The firing of a blast is generally accomplished by means of a safety fuse and by a detonator. With the old rudimentary procedure it naturally followed that frequent failures occurred and accidents happened.

The introduction for mining purposes of the Bickford fuse, said to be safe, was an advance in the right direction, but even it is still very far from being perfect and has its objectionable features.

The gutta percha fuse is better, but it costs four times as much as the ordinary fuse.

The Bickford fuse burns at about the rate of 0.80 meters a minute, but this rate is far from being reliable, and cannot be depended on. It frequently happens that burning ceases for some time in consequence of the charge being compressed or by the interference of some foreign body and other causes. Sometimes even a single drop of grease on the covering will prevent the fire from advancing for hours, and sometimes the opposite effect has occurred—that is, instantaneous combustion.

Accidents may frequently be explained by the method used by the operator in igniting the fuse. In order to expose the priming powder the miner slits the extremity of the fuse for several centimeters, and then ignites the charge by means of a match or piece of tinder. In order to light the tinder he uses the tinder box or draws the flame from his lamp through the gauze by means of a straw or tube of some kind, and at times even opens the lamp itself; but all of these methods are exceedingly dangerous, especially in mines containing fire-damp.

All of these difficulties are avoided when the charge is ignited directly by means of electricity.

By employing electric primers it is possible to fire several charges at once, thereby gaining much time in progress of the work.

Finally, it is much more economical to fire charges by means of electricity than by the use of fuses, as is shown by the following tables in the case of sinking a shaft of 500 meters:

Expenses of material and of a magneto machine for four simultaneous blasts, in sets of either 6, 8 or 9.....	80 francs (\$16).
Five hundred meters of double conductor, consisting of two wires covered with gutta percha and cotton, and wrapped together with cotton thread, at the rate of 16 francs (\$3.20) for 100 meters.....	80 " (\$16)
Putting in place and sundries.....	25 " (\$5)
Total.....	185 francs (\$37)

The operator requires no aid, for if the wires break, or are worn by rubbing, they can be easily repaired, hence they should last for years. Nevertheless, their cost price should be saved in a single year. In a large mine it is not too much to calculate an average of 4,000 to 5,000 blasts each year, and with this apparatus it would be equivalent to 4 centimes (8 mills) for each firing.

The cost of firing is (a) when powder is used,

	Centimes.
A simple primer for a spark with 1 meter of double conducting wire.....	10
An iron coupling wire covered with cotton, costing 3 francs (60 cents) a kilogram, with a length of 1½ meters, of which the price would be 7½ centimes. The loss from a series of explosions would not exceed 5 per cent.....	0.37
Total.....	10.37 (r 2.07 cents)

(b) When dynamite is used,

	Centimes.
A primer with a detonator containing 0.75 grams of fulminate and a double conductor of 1 meter.....	15.
A coupling wire, with loss at 5 per cent. as before.....	.37
Total.....	15.37 or 3.07 cents

The double conductor of the primer may be collected after the explosion and may be used again as a coupling wire, or for other purposes. Its value may be estimated a 1 centime (.02 of a cent).

The running expenses after taking off this amount are:

(a) Using powder.....	Centimes.	Cents.
(b) Using dynamite.....	9.37	1.87
Total cost as follows:	14.37	2.87

	a.	b.
	Centimes.	Centimes.
Material and plant.....	2.00	2.00
Running expenses.....	9.37	14.37
Total.....	11.37 = 2.27 cents.	16.37 = 3.27 cents

Comparing these figures with those corresponding to the use of fuses, we find that with powder the cost is with ordinary fuse 1.3 cents, and with gutta percha fuse, 4.99 cents. With dynamite and ordinary fuse it is 2.2 cents and with gutta percha fuse, 5.89 cents.

The use of the ordinary fuse would appear at first sight to be the most economical, but it must be remembered that this fuse is but little used even in dry work, because it is more easily injured and its manufacture is less careful. Besides, it is frequently doubled, in order to obviate the chances of failure.

But the comparison between the prices obtained from the ignition by the use of a gutta percha fuse or by electricity, is altogether in favor of electric fuses.

If, in addition to the fact of its economy, that by the latter process perfect security from danger is obtained, a much greater advantage is gained; and, finally, a better utilization of the explosive material is secured in consequence of the simultaneous explosions, hence it can be safely accepted that the use of electricity is necessary and soon will be used for all working in mines, especially in the excavation of shafts.

Lighting.—Electric lighting in mines consists of two kinds: First,

permanent lighting by stationary lamps, and second, lighting by portable lamps. In the first case arc lamps are used for all work on the surface, while incandescent lamps are employed for underground work.

It is chiefly underground that the advantages of electricity are particularly appreciable. The work becomes more sure, more regular, more rapid, and a circumstance which seems strange to relate, it appears that the moral nature of the miner improves with the environment of an agreeable light. Permanent lighting is not applicable to the working forces. Besides the uses of portable lamps attached to the principal conductors, as was tried it first, is dangerous and above all inconvenient. The coming in contact produces a spark, and besides, the moving of the switch board offers considerable difficulty, as a false movement may crack the lamp, break the cable, or expose the insulation.

It is, therefore, necessary in the drifts and working faces to make use of a lamp that is independent of all conducting wires, easily transported, capable of being suspended from the roof, attached to the walls, placed on the ground, or, in a word, a lamp that can be moved in all directions without losing its luminous intensity. To the same degree that the problem of permanent lighting is simple and easy to solve, so is that of portable lamps complicated and difficult. The following are the requisites for a good electric lamp for miners. It should first be of simple construction and solid; second, as light as possible; third, easy to take care of and re-charge; fourth, furnish a light having an intensity nearly constant for eight hours; fifth, have a lighting power of one to one a half candle-power as a minimum, and sixth be inexpensive.

In making comparison, we use as standard the Davy safety lamp (Clanny, Marsaut, Mueseler, Fumat, etc.) and it will be recollected that they are simple and solid, that the weight does not exceed 1 to 1½ kilograms, that they yield a constant light of from ¼ to ½ candle for 10 hours, at an average expense of 15 centimes (3 cents) for each filling.

One of the first portable electric lamps was that made by M. Trouvé, in which the generator of electricity is a bichromate battery, but the incandescence is only produced when the lamp is carried in the hand or suspended by a hook. Unfortunately the Trouvé lamp is heavy, its light is not steady, and it does not last longer than two hours.

Numerous models of lamps, with primary and secondary batteries, were submitted to the English Commission on accidents in mines (1879-1886), but none received approbation.

Since 1886, however, considerable progress has been made, and good accounts have been received of several lamps that are used in English mines, such as the Schanschiff and the Friedlander lamps, with primary batteries, and the Swan, Pitkin, and Higson lamps, using storage batteries.

All of these lamps possess the disadvantage of giving no indication of the surrounding atmosphere, and there must be used with them either a Davy lamp or a fire-damp indicator.

The oldest fire-damp indicator is that of M. Ansell (1865). It is based on the following principle:

Fire-damp, or even a mixture of fire-damp and air, will pass through a porous substance much more rapidly than pure air will, hence if a porous receptacle filled with air is placed in an atmosphere containing fire-damp, the mixed gases on the outside will penetrate into the vessel more rapidly than the air will pass out; in consequence an increase of pressure ensues, increasing to the extent that the entrance of the fire-damp is greater than that of the air that passes out.

In the Ansell indicator a rubber ball is used, which dilates to the extent that the pressure increases, and when the inflation reaches a certain limit a call is made by the closing of an electric circuit attached to a bell.

There are also the indicators devised by Libin, James A. Lyon, Living and Swan.

Swan has constructed an indicator which he adds to his portable electric lamp. He takes advantage for this purpose of the well-known property that a red-hot platinum wire has of becoming more brilliant in a fire-damp atmosphere than in pure air.

It is difficult to say which variety of portable lamp is the best. It is certain that in mines where there is already a good electric plant a lamp with a secondary battery may be used with advantage, but in all other cases a primary lamp is preferable. It is true, however, and must be said that as yet no lamp with a primary battery exists that is really practical and adapted to the exigencies of portable lighting in mines, such as are formulated by Prof. Sylvanus Thompson.

1. High electromotive force and fairly constant.
2. Interior resistance as weak as possible.
3. Impolarization, and must not become exhausted too readily.
4. Must only be in use when the circuit is open.
5. Must be a cheap apparatus, of solid construction, easily managed and must not give off any gas or corrosive fumes.

The lamps actually in existence are far from fulfilling all of these desiderata.

Some are too expensive, too heavy, too cumbersome, or have too great a resistance, while others contain corrosive liquids or are subject to electrical leakage.

Signals.—In mines where an electric current is in use all of the working places in the mine and the surface are connected by bells or a telephone system. The signals with bells are provided with spring binders, or keys with buttons, 12 to 15 centimeters in diameter.

The code of signals is generally very simple, and consists only of one, two or three bells. By means of signals and the telephone a permanent and instantaneous communication is established between the bottom of the mine and the surface. The mine ceases to be isolated, and it may be said that all its movements, all its pulsations are registered above ground. In case of accident, aid may be called for and sent to the exact locality at once. The combination of signals and the electric light in the workings makes possible a greater rapidity in the method of mining. The cages ascend and descend, so to speak, without interruption, without any false movement, by a simple pressure on the button of the bells at the top or bottom of the shaft; thus the work is constantly under control, and the labor becomes more perfect and of greater value.

Machine Drills.—The operation of drilling by percussion with electricity offers great difficulty, but nevertheless some interesting experiments have been made in the United States by the Sprague Electric Motor Company, the Union Electric Company and various engineers.

In all the experiments the bit is connected by a crank to the armature

of an electric motor, in which every revolution corresponds to a blow struck by the tool.

The application of an electric motor to rotary drilling, such as a steel cutter or diamonds is comparatively much easier, for the motion of the armature may be communicated directly to the gearing that controls the tool holder.

Taverdon has made some attempts in this direction with his diamond crown drill. Tedesco has also sought to apply the use of electricity to his drills.

Mechanical Cutting.—The electrical cutting machine of Messrs. Bowes, Blackburn & Mori has been recently (1887) tested in England.

The part carrying the tool holder, which consists essentially of a plate provided with blades or knives in the form of a star, receives its force from an electric motor located in the same frame and having a force of 6 to 9 H. P. This motor is connected by flexible conductors to a dynamo making 600 revolutions a minute. The cutting wheel describes a quarter of a circle in the coal mass, which it cuts away to the depth of about a meter.

The carriage is attached to a wheel and axle, by means of which it can be moved along the face.

It is possible to dispense with attaching the motor to the carriage, but then it is necessary to move it by chains or by means of a rope and pulley.

The Lechner cutting machine tested in the coal mines of Pennsylvania is attached to an electric motor transmitting power by means of a cord. A single motor will do the work of three cutting machines operating successively, thus permitting continuous working, for while the second or third cutting machine is in operation, the coal cut by the first can be loaded.

MINING AND METALLURGICAL CONGRESS IN PARIS.

From our Special Correspondent.

The Mining and Metallurgical Congress has opened auspiciously, and has held four most interesting sessions.

At the first session a glance showed that a most distinguished company had assembled, while relatively few of the well-known Anglo-Saxon and none of the well-known (or, for that matter, ill-known) German mining engineers were present. Many distinguished French and Belgian engineers were there. There were the stately Haton de la Goupilliere, the massive Coxe, the courtly Ledoux, the genial Roberts-Austen, and there, through his blue glasses, beamed the kindly eyes of the paternal Jordan.

At the first session the president, Castel, reviewed concisely and admirably the recent advances in mining and metallurgy, and pointed out the lines of weakness, the more pressing needs of the profession.

The second session was devoted to the discussion of the safety-lamp question. Le Chatelier first read an admirable paper, reviewing the present status of the more important lamps, especially the Marsaut, Mueseler, Fumat and Janney lamps. This was followed by a lively discussion, in which, among others, Marsaut and Fumat took part, the latter presenting a modified and greatly improved form of his lamp, which seems to have much promise. Like his earlier lamp, the air is fed to the flame from below, but unlike it, the former lamp, the present one stays alight even in the strongest draughts, and what is more surprising, is extinguished immediately when immersed in an explosive mixture. This was reported at the meeting to-day by Le Chatelier, who said that this was the first lamp with ascending air-current which he had ever known to become extinguished under these conditions.

The question of the fastenings was fully discussed. All are agreed that no form of key fastening should be tolerated, as the miners always manage sooner or later to pick the lock. A skeleton-key is soon made, soon after duplicated, and the safety of the lamp is gone. The method of fastening the lamp by soldering, or by means of a leaden rivet which holds together juxtaposed rivet holes in ears, one of them on the oil-cup, the other on the upper part of the lamp, gives decidedly better results, for, though the miner can open the lamp when fastened with either of these fastenings, and though he of course vows that the fastening was defective when the lamp was given him, yet if a record be kept of the men who bring back lamps which have been opened, those who habitually or even repeatedly open their lamps are detected. Still safer are the hydraulic and the magnetic fastenings. Both of these close the lamp so that the miner cannot open it by any possibility, except by smashing it. The hydraulic fastening consists of a powerful spring, like that of a Bourdon gauge, which can be opened only by admitting into it some fluid under extremely high pressure, when the spring tends to straighten. The magnetic fastening also consists of a powerful spring, which can be opened only by means of a very powerful magnet. Needless to say, neither miner nor foreman can readily provide himself underground with fluid under strong pressure nor with such a magnet.

Means of lighting the lamp without opening it were discussed. These, if perfected, remove the miners' chief reason for wishing to open the lamp. Besides several other igniting substances for this purpose, sodium amalgam was said to have given promise.

The session of the third day was devoted to the discussion of improvement in decarburizing and dephosphorizing iron. The discussion turned chiefly on the basic open-hearth process, and on Rollet's desulphurizing and dephosphorizing cupola fusion. It is hinted that he is in treaty with an American siderurgical Napoleon for the use of his process in the United States.

Remaury gave an interesting account of the results obtained with his and Valton's chrome lining for basic open-hearth furnaces. It is to be used in the open-hearth plant which Sir Lowthian Bell is building, and I learn of two French establishments which have used it. The condition of the basic open-hearth process in Austria and elsewhere was fully described.

Rollet's process seems full of promise, as preparatory to the production of the best grades of steel, and as a desulphurizing process to be used in conjunction with the basic open-hearth. Lodin pointed out that while dephosphorization demands strongly oxidizing conditions, such as the basic open-hearth offers, desulphurizing is favored by deoxidizing conditions, which, of course, favor the deoxidation of lime and the formation of sulphide of calcium, which passes into the slag; hence, in his view, the relative

inefficiency of the basic open-hearth furnace and the success of Rollet's cupola fusion as a desulphurizing agent. Rollet's process consists in melting pig-iron in a cupola furnace with a very basic lime slag, rendered moderately fluid by adding fluor-spar. It has given excellent results in the basin of the Loire. A brief account by Howe of the enormous outputs of our bessemer works, under Jones and Forsyth, under Scranton, Wood and Potter, found an audience ready, perhaps eager, to be impressed with the mechanical prowess, the administrative genius of the American.

At the end of the session M. Gillon, the presiding officer, called attention to an important modification of procedure in the basic bessemer process. During the early part of the afterblow we have a rapid oxidation and scorification of phosphorus, while relatively little iron is scorified. Toward the end of the afterblow, however, iron burns and scorifies rapidly and thus dilutes the slag, bringing its proportion of phosphoric acid undesirably low for agricultural purposes. The modification described by M. Gillon consists essentially in fractionating the slag, obtaining an early, highly phosphoric slag, very valuable as a manure, and a late ferruginous slag, rich enough in iron oxide to be smelted advantageously in the blast furnace. This is accomplished by the very simple expedient of charging in the first place only about two-thirds of the lime needed for removing the whole of the phosphorus, interrupting the afterblow when it is about two-thirds over, and removing the slag then present. The remainder of the lime is then added, the afterblow resumed and finished, and the final slag in turn removed as a separate product, rich in iron.

At the fourth session the question of the use of explosives in firing mines was taken up. Mallard opened the discussion with a masterly presentation of the leading features of the problem. First stating the number of accidents per 1,000 men employed per annum had actually increased, he pointed that this simply meant that, great as is the care taken, much as the vigilance has increased, much as our knowledge and our appliances have been perfected, with increasing average depth of working the difficulty of preventing explosions and of limiting their consequences has increased still more.

He next pointed out that explosives were much less dangerous than black powder, because a quite appreciable length of time is needed to ignite fire-damp, and because explosives burn incomparably more rapidly than powder. Powder indeed may be said to "deflagrate;" its combustion proceeds from grain to grain. Explosives, on the other hand, explode almost absolutely instantaneously, the velocity of propagation of the explosion being about 15,000 feet per second.

In order that as much as possible of the energy of the explosion should be absorbed in doing mechanical work, leaving as little as possible available for raising the temperature of the products of explosion, and in order that the products might thus be as cool as possible and as little likely to inflame the fire-damp, the explosive itself should be pointed out, be compact, thoroughly tamped, and used in great moderation.

He classified binary explosives into those whose products do and those whose products do not mutually re-act, cross-classifying them according to the nature of the components, *e. g.*, according to whether they are explosive or not, undecomposable (as sand) or decomposable (as carbonate of soda, sulphate of magnesia), simply combustible or containing in themselves the elements of combustion (*comburants*).

Other speakers insisted on the importance of tamping, one citing experiments in which poorly-tamped charges threw out flame in nearly thrice as large a proportion of cases as well-tamped ones, on the danger due to explosives which threw out incandescent solid matter, and to tamping with coal, as, becoming incandescent, it is especially likely to ignite the fire-damp, and on the great importance, especially in test-trials and in all other investigations, of using only explosives of known composition, the composition, and hence the properties of those sold under a given trade name, often varying so greatly as to practically destroy the value of investigations made with them.

Determination of Tungsten in Richly Tungstiferous Alloys.—Dr. Jos. Preusser.—From 0.5 to 1 gm. of the alloy, broken up in a steel mortar, finely pulverized, and sifted through lawn, is heated in a shallow porcelain capsule on a Bunsen burner, before the blast, or in the muffle, until the color, which is at first greenish yellow, passes into a completely pure yellow. Over the Bunsen burner this is generally effected in a few hours. No loss of tungstic acid is occasioned by excessive or prolonged ignition. The mass is then rinsed into a porcelain capsule and evaporated down once with aqua regia. It is then repeatedly evaporated to dryness with hydrochloric acid, and heated on the air bath to 120°. It is then taken up in dilute acid, let stand for some hours, and filtered. The tungstic and silicic acids left on the filter are ignited in a platinum crucible, after incineration of the paper, intimately mixed with three-fourth parts of sodium carbonate and ignited before the blast for thirty minutes. When cold the melt is dissolved in hot water, filtered, and any tungstic acid not opened up is again fused with sodium carbonate. The filtrate, containing the tungstic acid as a sodium salt, is mixed with hydrochloric acid, when the tungstic acid separates out almost entirely as a white hydrate; but for its complete separation, the filtrate, after the addition of acid, must be evaporated down to dryness. It is then dissolved in water, and, after standing for a few hours, it is filtered by means of the filter-pump and washed with a dilute solution of ammonium nitrate. The precipitate along with the paper is placed in an Erlenmeyer flask. Any hydrate adhering to the porcelain capsule is dissolved off by means of ammonia and added to the contents of the flask, which are brought into solution as ammonium tungstate by the addition of ammonia and gentle heating on a hot plate. The silicic acid remains practically undissolved. The slight error due to the sparing solubility of silica in ammonia may be disregarded. The solution is freed by filtration from the silica evaporated down in a tared porcelain capsule and the residue ignited until its weight is constant. If tin is present in the alloy the method of Donath and Müller is applicable. The metal is roasted, evaporated to dryness with aqua regia, heated to 120 degrees, taken up in dilute acid, and the residue is treated according to the instructions of the authors above-mentioned, with the addition of the method just described for separating tungstic acid from silica.—*Zeit. Anat. Chem.*

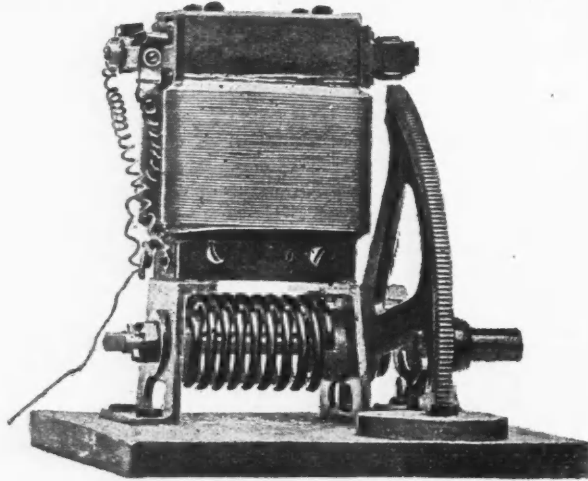
ELECTRIC BLASTING

We illustrate a new battery for electric blasting, which subject is fully dealt with in the able paper in this issue by M. Chalon on the "Use of Electricity in Mines." The battery in question is called the "Crescent," and is manufactured by the Ingersoll-Sergeant Rock Drill Company of this city.

The Crescent battery is said to be the only electric blasting machine which discharges a uniform current of electricity at every operation, no matter who may use it. It does not depend upon the skill or personal equation of the operator, and, what is very important, there are no parts liable to break or get out of order.

The following is a description of the machine:

A strong steel wire spring is fixed to a shaft which carries a racked



ELECTRIC BLASTING BATTERY.

segment. The operator, when he presses the lever over, simply tightens the spring, and at a certain fixed point the lever is automatically released from its contact with the shaft, and the recoil of the spring gives a rapid and uniform movement to the armature, which generates the current.

A nut is provided for giving greater or less tension to the spring, thus adjusting the capacity of the battery. The spring never breaks.

Those who are familiar with electric blasting will not fail to appreciate the great importance of a uniform discharge. Missfires and serious accidents are often due directly to a lack of uniform strength in the battery current—one hole will fire while another in the same circuit will miss. With the Crescent it is claimed that one can estimate with certainty that a certain number of holes will go off at each operation.

Susini's Sulphuric Ether Motor.—M. de Susini, a Corsican doctor, has, it is asserted, after twenty years' perseverance, constructed a motive apparatus or propeller of 20 H. P., which is worked by sulphuric ether, a result which the doctor anticipates will realize a saving of 65 per cent. of the combustible material at present employed for setting machinery in motion.

A Mammoth Gun.—A cast-steel gun weighing 235 tons, has just been shipped by Messrs. Krupp from Hamburg for Kronstadt. The calibre of the gun is 13½ inches, the barrel is 40 feet in length, its greatest diameter being 6½ feet. The range of the gun is over 11 miles, and it will fire two shots per minute, each shot costing \$1,250 to \$1,500. At the trials of the gun, held in the presence of Russian officers at Meppen, the range of the Essen firm, the projectile, 4 feet long, and weighing 1,800 pounds, and propelled by a charge of 700 pounds of powder, penetrated 19½ inches of armor, and went 1,312 yards beyond the target. The gun, which is the largest in existence, and the heaviest yet exported by Messrs. Krupp, had to be carried from Essen to Hamburg on a car specially constructed for the purpose.

Active Volcano in Mexico.—Steven Heaton, an American railroad contractor from Colima, has been an eye-witness of the late eruption of the volcano of Colima, which is thirty miles north of the city of the same name. This volcano has its crater at an elevation of 12,000 feet above the sea level, and is very active, intermittently throwing up a column of smoke and red-hot ashes hundreds of feet in the air. These spasmodic eruptions occur about ten or twelve times a day and are followed by reports similar to the discharge of artillery. It is not known whether or not any lava is being thrown out, as the red-hot ashes make investigation impossible. At night the sudden eruptions present the appearance of fireworks of a gigantic character. These sudden outbursts illuminate the country for miles around, and the spectacle is a grand one.

A Large Cable Hoisting Plant.—The Trenton Iron Company, of Trenton, N. J., has completed a tramway in the Blackington Farm quarry of Rockland, Conn., which has one of the longest stretches of cable and is one of the biggest plants of the kind in this country. The cable is 1½ inches thick, of cast steel with a steel center, and is 1,256 feet long. The weight of the wire on its reel was 10,000 pounds. The anchorage weight at the power end is seventy-five tons, while the weight of the wire with its pulleys, cars, etc., is thirty-six tons. The breaking strain of the wire is 110 tons. The cable is passed over towers 42 feet high, and the wire in the sag is 125 feet above the quarry floor. The hoisting apparatus consists of a traveling car, which goes back and forth on the wire, never leaving it, and nineteen trolley blocks which support the wire that controls the fall block, which lowers the drag or bucket into the quarry. The apparatus allows the drag or bucket to be lowered and hoisted from any point on the quarry floor the entire length of the wire.

A New Process of Welding.—The Redeman-Telford Steel Company, of Louisville, Ky., says *The Age of Steel*, are continuing to make experiments with their new process. Their recent experiments have been chiefly with laminated steel. Two or more sheets of steel treated by their process, with iron sheets sandwiched in between the steels, have been welded together in one heat. After being taken from the fire it requires a great deal of force to separate the layers, and after they have been rolled once the welding is so firm that it is quite impossible to separate them. The Hall Safe and Lock Company have experimented with the Redeman-Telford steel, and are said to pronounce it superior to their own laminated steel, made at great expense. The Redeman-Telford steel after treatment is very soft, and holes are easily punched in it; but after tempering it is almost impossible to drill a hole into the sheets with the finest tools made of Musket steel. The tempering is effected by heating the iron once, and then immersing it in cold water. Specimens of the tempered Redeman-Telford steel were submitted to the Navy Department, and naval officers say that the process seems to be a rediscovery of the lost art of making Damascus steel.

DIVIDENDS PAID BY MINING COMPANIES DURING SEPTEMBER AND SINCE JANUARY 1ST, 1889.

NAME OF COMPANY.	Paid in Sept.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in Sept.	Paid since Jan. 1st.
Alaska, Alaska.....		25,000	Jay Gould, Mont.....		74,000
Alma, Idaho.....		15,000	Lexington, Mont.....		64,000
American & Nettie, Colo.....		34,000	Mammoth, Utah.....		20,000
Aspen, Colo.....		280,000	Mt. Diablo, Nev.....		30,000
Atlantic, Mich.....		80,000	Monitor, Dak.....	12,500	25,000
Boston & Mont., Mont.....		400,000	Montana Lt., Mont.....		123,750
Caledonia, Dak.....	8,000	72,000	Morning Star, Colo.....		25,000
Calliope, Colo.....	10,000	10,000	Napa, Cal.....		20,000
Calumet & Hecla, Mich.....		1,000,000	Navajo, Nev.....		40,000
Central, Mich.....		40,000	N. Y. & Hond. R. C. A.....		30,000
Colorado Central, Colo.....		55,000	New Gaston, Colo.....		50,000
Confidence, Nev.....		24,960	Ontario, Utah.....	75,000	675,000
Cons. Cal. & Va., Nev.....	108,000	756,000	Osceola, Mich.....		50,000
Copper Queen, Ariz.....		70,000	Pamlico, Nev.....		12,000
Coeur d'Alene, Idaho.....	20,000	55,000	Parrot, Mont.....		36,000
Derbec Gravel, Col.....	10,000	20,000	Phumas-Eureka, Cal.....		70,312
Daly, Utah.....	37,500	337,500	Poorman, Colo.....		15,000
Deer Creek, Idaho.....		10,000	Silver Cord, Colo.....		50,000
Dunkin, Colo.....		30,000	Silver Mfg. of L. V., N. M.....		25,000
Evening Star, Colo.....		12,500	Sierra Nevada, Idaho.....		20,000
Granby Mfg. & Sm., Mo.....		20,000	Small Hopes, Colo.....		25,000
Granite Mt., Mont.....	200,000	1,800,000	Tamarack, Mich.....		320,000
Homestake, Dak.....	12,500	150,000	Quicksilver, Cal, Pref.....		128,738
Hecla, Mont.....	15,000	135,000	Quincy, Mich.....		280,000
Ivanhoe, Colo.....		10,000	Ward Cons., Colo.....		10,000
Idaho, Cal.....	15,500	131,750	Webb City, Mo.....		4,400
Illinois, N. M.....		20,000	Young America, Cal.....		10,000
Iron Silver, Colo.....		100,000			
Jackson, Nev.....		5,000	Total, 51 companies.....	524,000	7,937,910

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

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

PATENTS GRANTED OCTOBER 1ST, 1889.	
411,780.	Flanging Machine, John R. Brownell, Dayton, Ohio.
411,782.	Governor for Electro-Dynamic Machines, George F. Card, Covington, Ky., Assignor to the George F. Card Manufacturing Company, Cincinnati, Ohio.
411,784.	Apparatus for Vaporizing and Burning Petroleum, Harry Cluff, Grand Rapids, Mich.
411,796.	Exploding Primer, Stephen H. Emmons, London, England.
411,807.	Flange-Wrench, James F. Guthrie, Jr., Somerville, Assignor of one-half to Thomas C. Ashley, Boston, Mass.
411,810.	Double-Acting Pump, Casper Harwick, Canal Fulton, Ohio.
411,814.	Pit Furnace, Louis G. Laurean, Philadelphia, Pa.
411,818.	Anti-Friction Bearing, Hosea W. Libbey, Boston, Mass.
411,819.	Car Coupling, Daniel F. McCarthy, St. Paul, Minn.
411,826.	Power Fan, Peter Murray, Jr., Newark, N. J.
411,833.	Electric Motor, Charles C. Peck, Middlebury, Vt., Assignor to the Giant Electric Motor Company, Kittery, Me.
411,848.	Composition for Fuel, George A. Zwick, Covington, Ky.
411,865.	Furnace, Robert LeLas, Walnut Tree, near Cardiff, England, and Albert Robin, Paris, France.
411,881.	Crusher, David H. Anderson, Granite, Mont.
411,889.	Electro-Magnetic Separator, Richard F. Moffat, New York, N. Y., Assignor, by direct and mesne assignments, to the Moffat Electric Construction Company, of New York.
411,902.	Apparatus for Handling Coal, Geo. W. Rawson, Cambridge, Mass.
411,914.	Hydrocarbon-Engine, Robert Aldrich, Millville, Mass.
411,941.	Mechanism for Bending Metal Bars, George W. Taft, Kennett Square, Pa.
411,958.	Railway Rail Clamp, Robert Forsyth, Chicago, Ill.
411,959.	Metallic Railway Tie, Robert Forsyth, Chicago, Ill.
411,982.	Electric Motor, Philip Diehl, Elizabeth, N. J.
412,000.	Support for Railway Rails, John M. Robbins, Leominster, Mass.
412,010.	Machine for Rolling Seamless Tubing, William H. Appleton, New York, N. Y.
412,011.	Machine for Rolling Seamless Tubing from Hollow Ingots, William H. Appleton, New York, N. Y.
412,012.	Machine for Rolling Seamless Tubing, William H. Appleton, New York, N. Y.
412,016.	Manufacture of Alloys of Zinc, Johannes C. Bull, Erith, County of Kent, England.
412,017.	Process of Making Alloyed Raised Gold Plates with Corrugated Back-ground for Jewelry, Joseph Bulova, New York, N. Y.
412,019.	Grinding Mill, Mortimer C. Cogswell, Brooklyn, N. Y.
412,021.	Imitation White and Colored Marble, Jean M. Danielli, Paris, France.
412,042.	Automatic Dumping Cage, Burt Russell and Harry T. Parsons, Braidwood, Ill.
412,077.	Lubricator, Benjamin B. Eldred and Kavanaugh B. Rheim, Laramie City, Wyo.; said Rheim assignor to said Eldred.
412,082.	Apparatus for Making Spiral Screw-Threads, Henry H. Forsyth, Chicago, Ill.
412,095.	Electric Subway, Isaac La R. Johnson, Washington, D. C., Assignor of one-half to Oliver T. Thompson, same place.
412,122.	Welding Machine, Thomas F. Rowland, New York, N. Y.
412,155.	Trolley for Electric Railway Service, Albert Anderson, Boston, Mass., Assignor to Charles L. Edgar, trustee, same place.
412,168.	Air Brake, Theron S. E. Dixon, Hyde Park, Ill.
412,172.	Separator, John M. Finch, Crockett, Assignor of part to John R. Cross, San Francisco, George Riley, Vallejo, and Frank Miller, Marysville, Cal.
412,175.	Blast-Furnace Top, Fred W. Gordon and Victor O. Strobel, Philadelphia, Pa., Assignors to Gordon, Strobel & Laurean, same place.
412,180.	Ore-Concentrator, Emory B. Hastings, Georgetown, Assignor of one-fourth to Charles P. O'Reilly and William K. Ure, both of Denver, Colo.
412,187.	Tube-Welding Furnace, Harry Jeffrey, Ludlow, Ky., Assignor of one-half to Fred. Hoeffle, Meridian, Miss.
412,200.	Hydrocarbon Vaporizer and Burner, Thomas J. Ogle, Chicago, Ill., Assignor of two-thirds to William R. Moore and Mortimer H. Bentley, both of same place.

PERSONALS.

S. Wollberg, the well-known mining broker, formerly of New York City, of the firm of Zadig, Wollberg & Co., has returned to San Francisco from his European trip.

Mr. E. R. Baldrige, superintendent of the Blair Iron and Coal Company, of Hollidaysburg, Pa., has resigned that position and accepted the superintendency of a coal and coke company recently organized at that place.

A. W. Nibelius, Superintendent of the American Forcite Powder Manufacturing Company's works at Lake Hopatcong, N. J., resigned his position October 1st. Mr. Nibelius is a Swedish engineer employed by the company ever since the building of the works.

Prof. O. C. Marsh, of Yale University, New Haven, Conn., is in Deadwood, Dak., making an investigation of the fossils of the bad lands, and also examining the refractory ores of the Bald Mountain district. He is studying them, it is said, together with Professor Carpenter, of the School of Mines at Rapid City.

Mr. John Rinard, who for many years has been superintendent of the converting department of the Edgar Thomson Steel Works, Braddock, Pa., has tendered his resignation, to take effect at once. Mr. Rinard will be succeeded by Mr. Harry Benn, who has been an attaché of his office for the past three years.

Mr. W. de L. Benedict, the well-known mining engineer, has returned to New York from a short examination of Canadian phosphate properties. Mr. Benedict states that American energy and enterprise and a moderate investment of capital would work wonders with many valuable properties that are now comparatively neglected.

M. Julien, of Brussels, the inventor of the well-known Julien system in operation on the Fourth avenue line, this city, has been awarded the gold medal at the Paris Exposition for his storage batteries there shown. M. Julien has received awards at Antwerp, in 1885, by the well-known International Congress appointed by the government to report as to the best manner of propulsion of tram cars; Paris, in 1886, and at Brussels in 1888, when the Cross of Leopold was presented him for the invention.

The fifty-eighth annual fair of the American Institute opened on Wednesday at the Institute Building, Third avenue and Sixty-third street, N. Y. City. There were addresses by President J. Trumbull Smith and L. E. Chittenden, but, strangely enough, there was not the slightest reference to the coming World's Fair to be held in this city. It appears that the venerable managers of the Institute expressly desired that this omission should occur, and cautioned the speakers to make no reference to any coming fair but the American Institute fair. There was a large attendance, and some of the exhibits were ready. All the floor space has been rented, and the admission fee will be twenty-five cents, as that popular price proved successful last year.

The autumn meeting of the Iron and Steel Institute took place at Paris, at the Hall of the Société d'Encouragement pour l'Industrie Nationale, on Tuesday and Wednesday, the 24th and 25th days of September, commencing at 9 A. M. each day. The papers read were: "Notes on the Iron and Steel Manufacture in France in 1887, as illustrated by the French Exhibits at the Paris Exhibition." By Professor Jordan, Paris. "On Gaseous Fuel." By Sir Lowthian Bell, Bart, F. R. S., Middlesbrough. "On Alloys of Iron and Silicon." By Mr. R. A. Haddfield, Sheffield. "On the Effect of Tungsten on Mild Steel." By Mr. A. E. Tucker and Mr. T. W. Harbord. "On a New Form of Siemens Furnace, arranged to Recover Waste Gases as well as Waste Heat." By Mr. John Head, M. Inst. C. E., London, and Mr. P. Pouff, Nevers. "On the Robert Bessemer Process." By Mr. L. Garrison, Philadelphia.

The following are some of the awards at the Paris Exposition to American exhibitors:

The Grand Prix—To the Thomson-Houston Company, to Edison, and to the Bell Telephone Company, for electrical appliances; to Tiffany & Co., the Gorham Manufacturing Company, the Rookwood Pottery Company, of Cincinnati, the Rensselaer Polytechnic Institute, of Troy, the Boston Institute of Technology, and the exhibition of the United States Agricultural Department, which is second only to that of France.

Gold Medals—To Cornell University, the University of Michigan, the Sweet Engine Works of Syracuse, the Brown Engine Works of Worcester, Mass.; the State of Nevada, for an exceptionally fine exhibit of minerals; the Graphophone and the Yale Lock Companies.

The State of Florida will probably receive a silver medal for its exhibits, and it is probable that Mr. Kountz, Tiffany's expert in gems, will receive the medal, as will Mr. Foote, of Philadelphia, for the collection of minerals.

OBITUARY.

John Hogan, a wealthy steel manufacturer of New York, died suddenly at his home in Montclair, N. J., on the 30th ult., of neuralgia of the heart. He was 63 years old.

James Ives, who was the originator of the Mt. Carmel Manufacturing Company, the founder of the Hamden Iron Company and president of the Mount

Carmel Bolt Company, died recently in his native town. He was closely identified with local manufacturing interests.

The death of John J. Thomas, one of the oldest members of the Consolidated Stock and Petroleum Exchange, of New York, was announced on Tuesday. He joined the old New York Mining Exchange in 1877, and was prominent as a commission broker for several years and was also chairman of the Mining Committee.

Frederick Habirshaw, formerly engaged with the Downer Oil Company, Boston, Mass., died in Paris, Sept. 27, aged forty-seven. He was one of the leading experts in the country on mineral oil and hydrocarbons, and in no small measure helped to bring the refining of coal oil to its present stage of excellence. He was also a distinguished naturalist.

Dr. James Porter Greves, at one time prominently connected with various mining interests in Wisconsin and Nevada, and a resident of New York City for several years, died at his home in Riverside, Cal., recently, aged eighty years. In 1859 he became interested in iron and copper mining on Lake Superior. Afterward he moved to Nevada, where he bought silver mines, and was one of the first settlers in the town of Austin. About twenty years ago he settled in Southern California, where he has lived ever since.

Captain William Richard Jones, the able general manager of the Edgar Thomson Steel Works, Pennsylvania, died on the 28th ult. from injuries received from the bursting of Furnace C of his works, when the molten metal was thrown over a number of men, including Captain Jones. No man connected with the steel works of this country was better known or more highly esteemed, and in his untimely death the company and the entire community have sustained a severe loss. In our next issue we hope to publish a portrait and biography of this representative American.

George B. N. Tower, ex-Chief Engineer of the Navy, died at his home in Brooklyn on the 1st inst. He was born in Boston in 1834. He became chief engineer in 1863, served with distinction in the various squadrons throughout the war, and at its close, in 1865, resigned from the service to follow his profession of civil engineering. He made several valuable inventions, was an expert in patent cases, wrote a number of books relating to his profession, was for some time professor in the scientific department of Dartmouth College, and about five years ago was supervising inspector of steam vessels at New York City.

Robert Graham Ford, until recently General Manager of the Clearfield and Jefferson & Bell's Gap Railroad Companies, Pa., died this week. He had just been appointed General Manager of the Colorado Coal and Iron Company, of Colorado, as mentioned in our issue of Sept. 21st, and was well known in connection with the iron and steel industries of this country. Mr. Ford was born at Centerville, Indiana County, Pa., February 13th, 1846. Six years thereafter his parents moved to Blairsville, Pa., where he entered the school at that place, graduating from the high school at the early age of sixteen years. During the war, and while yet in school, he earned his first money as newsboy. After graduating, he went to his father's store, and while there studied telegraphing. Leaving the store before he was seventeen, he entered the telegraph office at Berry's Station. A few months thereafter he was given charge of the telegraph office and general agency at Penn Station, remaining there in this capacity for eleven years. In the meantime he became identified with the Penn Gas Coal Company. In 1874 he became General Superintendent of the Millwood Coal and Coke Company, of Millwood, Pa. In March, 1879, he came to Bellwood, as Superintendent of the Bell's Gap Railroad, since which time he has been in that capacity with all its various enterprises.

INDUSTRIAL NOTES.

The Italian Government will start a line of steamers to Mexico early next year.

Mr. Thomas A. Edison sailed from Havre for New York on Saturday last and will arrive here next Sunday.

Melbourne is spending a large sum of money constructing a ship canal and dock on the West Melbourne swamps.

The Thomson-Houston Welding Company will shortly commence the erection of a new factory in Lynn. The building will be 200 feet long and 100 feet wide.

The Argentine Republic has announced that ships' manifests must contain the names of consignees of cargo, and that this rule will, in future, be strictly enforced.

The German-Australian Steamship Company have arranged that their new service of boats from Hamburg to Australia shall call at Antwerp, the Belgian Government paying 39,000 francs a year.

The Brazilian Government will subsidize two European lines, one Santos and Hamburg via Lisbon, the other Santos and Genoa via Marseilles. The contract is for 15 years, \$150,000 per year, with a minimum of 12 round trips each year.

The old Waldorf furnace, situated at Irontown, Taylor County, W. Va., it is reported, has been sold

at auction for \$3,000, and will be torn down and the material removed to Ohio. When this furnace was built in 1873 it is said it cost the owners \$100,000.

A reduction in the export tariff of rails and rail fastening material came in force in Germany on the 1st of August. It applies to all ports on the German Ocean and to all rails which are sent out of Europe only. The new charge amounts to 1.7 pf. (about 1s. ½d.).

It is reported that the Duff Company steam forge works at Troy, Ohio, has decided to find a new location at West Superior, Wis. Business men of that place have offered the works a tract of land valued at \$15,000, with a cash bonus of \$5,000 in addition. The machinery of the plant will be removed shortly.

Certain creditors of Messrs. Graff, Bennett & Co., the insolvent iron firm of Pittsburg, Pa., it is reported, have filed a bill in equity in the county court against the members of the firm and the trustees, alleging that the defendants fraudulently sold property for \$250,000 that was worth at least \$500,000.

Details are published of the scheme adopted by the Japanese Government for the improvement of Yokohama harbor. A pier will be constructed, 62 feet wide, with a double line of rails, sidings and all other accessories of wharves. A railway will connect the pier with the railway station.

The Parliament of New South Wales has recently voted the sum of £1,360,000 for the purchase of a certain number of railway locomotives and wagons.

Our locomotive works and wagon builders should have a good chance of securing a fair proportion at least of these orders, as American locomotives and wagons are already highly approved of in Australia.

The Thomson Electric Welding Company are now able to weld cable wire 1 5-16 inches in diameter, showing a greater efficiency than was thought possible in doing this work. The strength of joints obtained by splicing was about 30 per cent. that of the original cable; and it was found from tests made at the Watertown Arsenal of electric welds made of this cable that 87 per cent. of the efficiency of the rope itself had been obtained in the welds.

In the Chancery Court at Jersey City on the 14th inst. Chancellor McGill rendered a decision in the litigation over the ownership of a controlling interest in the stock of the Joseph Dixon Crucible Company, which has been in dispute between Mayor Cleveland and F. F. C. Smith, the receiver appointed by the courts, and to which we referred in the ENGINEERING AND MINING JOURNAL of August 24th. The Chancellor holds that title to the stocks is vested in Mr. Cleveland, but that the receiver is empowered to order an immediate sale if necessary.

The Joggins' Raft Company has been incorporated to do business in Canadian and American lumber on the Pacific coast. The capital is \$300,000, with a reserve of double that amount. The rafts are to be built like the original Joggins raft, conveyed from Nova Scotia to New York, to which we referred in our issue of July 28th, 1888. They are to be cigar-shaped, and will contain 3,000,000 feet of lumber. A saving of freight of \$2 per 1,000 feet will be effected. J. D. Spreckels & Co. and William Donahue, of San Francisco, are said to be the leading promoters.

The Fottrell Insulated Wire Company recently organized at Reading, Pa., with a capital stock of \$1,000,000. The purpose is to manufacture electric light, telegraph and telephone wires and insulated tapes under the Fottrell process. The process is said to be a new one, and the wire may be laid in the ground without any protecting armor and subjected to heavy currents and high voltages without injury to the insulation and with absolute certainty of it at all times fulfilling the requirements. An extensive plant is to be built at Colebrook, Lebanon County. The officers are John R. White, of Philadelphia, President; J. M. Schenk, of Lebanon, Vice-President and General Manager.

CONTRACTING NOTES.

The new iron wharf built at Fortress Monroe, Va., for the government, at a cost of \$150,000, has been completed and accepted.

The Navy Department has asked for proposals for steel for use in the construction of the two new cruisers of 3,000 tons each, known as Nos. 7 and 8, which the government will build at the New York and Norfolk navy yards. Bids will be opened October 31st.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

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

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

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward

them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

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

GOODS WANTED AT HOME.

237. Ice machine, 5 tons daily capacity. South Carolina.

238. Noiseless street motor immediately, to haul standard cars with 30 tons freight around short street curves. South Carolina.

239. Second-hand machinery for hoisting and pile driving. Also portable double drum and engine and boiler complete. Rhode Island.

240. System of warm water heating for offices and stores. Virginia.

241. Second-hand Norwalk air compressor, 1888 pattern, capacity 4 to 6 three-inch drills. Must be in good working order and age of compressor must be stated. Michigan.

242. Suspension drill press and pulley. Also table for boring out fly and other wheels. Maryland.

243. Second-hand light rails, 24 or 36 pounds. New York.

244. Estimates on cost of building complete coke plant of 100 ovens, with washing and crushing machinery. Ohio.

245. One power pipe-cutting and threading machine, range from 2 1/2 to 8 inches, inclusive. Mississippi.

246. Names and addresses of lapidaries or jewelers who make or handle diamond dies for the purpose of drawing wire. Ohio.

248. Engine, 15 H. P., that regulates well and is economical in the use of steam. North Carolina.

249. Wood-working machinery; sash, door and blind outfit; a wood-turning lathe, a hand-saw, a jig or scroll saw and resawing machine for siding. North Carolina.

250. Engine, 1/2 to 3/4 H. P. Kentucky.

251. Addresses of well-borers and manufacturers of well-boring machines. Alabama.

252. New or second-hand mining machinery; two 60 H. P. boilers, one 40 or 60 H. P. hoisting engine, 12 T-rails, wire rope, sheave wheels, mine cars, elevator chain, sprocket wheels, buckets, steam pump, etc. Alabama.

253. Saw mill, with engine and boiler complete, with capacity of 6 to 10 M. feet lumber per day. Alabama.

254. Engine, 4 or 5 H. P., for foundry. North Carolina.

255. Catalogues of boilers, engines, shafting, wooden and iron pulleys. West Virginia.

256. Names and addresses of firms who make a specialty of iron canal headgates. Utah.

257. Quarrying machinery; 12 gangs of saws and possibly 2 rubbing beds. Tennessee.

258. Hoisting engines and boilers, 10 and 20 H. P., crusher, lead-smelting furnace, 5 to 10 tons capacity; a reversible hoist wheel, buckets, rope, etc., and miners' oil. Catalogues of mining machinery, stating net prices.

265. Heating apparatus, furniture, etc., for a hotel now being built. Virginia.

266. Wanted, one mile 2 in. wrought iron water-pipe; two miles of 4-in., 6-in., 8-in. and 10-in., and one mile of 12-in. C. I. water-pipe, all sizes; 3/4-in. to 4 in. gas pipe, and malleable iron fittings, lamps and lamp posts. Virginia.

AMERICAN GOODS WANTED ABROAD.

201. Pony carriage, four-wheeled, to carry four adapted in size for ponies from Shetlands to 14 1/2 hands high. Queensland, Australia.

202. Prices on one sacks per thousand. Mexico.

203. One 60 to 80 H. P. horizontal engine, plain side valves. Cuba.

204. Fifty sugar wagons. Cuba.

205. Four centrifugal machines, Western, new or second hand, in good condition. Cash or on delivery. For shipment to sugar plantation in Cuba. New York.

206. Flour mill machinery; small plant. Mexico.

211. Carriage and buggy furnishings, shafts and whips. Philippine Islands.

212. Platform scales. Philippine Islands.

213. Windmills and pumping machinery for irrigation work. Philippine Islands.

214. Stone channelling and quarrying machine. Philippine Islands.

215. Cheap watches. Philippine Islands.

216. Varnish and spirits of turpentine. Philippine Islands.

217. Kerosene oil, 135 degrees and 150 degrees flash. Queensland, Australia.

218. Dried apples in quarters and other fruit in tins. Queensland, Australia.

219. Cream tartar. Queensland, Australia.

220. Clothes-pins. Queensland, Australia.

221. Tobacco. Queensland, Australia.

222. Canned goods. Soup and oysters. Queensland, Australia.

233. Pump, to pump 50,000 gallons per day (10 working hours) a distance of four miles, with an elevation of 500 feet, engine and pipe; state price f.o.b. New York, also freight by car lot, to Guaymos and to Hermosillo, Mexico.

234. Mine pump. Mexico.

235. Catalogues, mining machinery, pans and settlers, shoes and dies. Mexico.

247. Catalogues of brick-making machines. Mexico.

259. Shooks wanted. Size and thickness of wood for boxes: 30 gross lots No. 4, side, 10 x 3 1/2 x 1/8 in.; ends, 5 x 3 1/2 x 3/8 in.; bottoms, 10 x 5 1/2 x 1/8 in.; 30 gross lots No. 7, sides, 11 1/2 x 1/8 in.; ends, 6 x 3/8 in.; bottoms, 11 1/2 x 6 1/4 x 1/8 in. 10 gross lots No. 8, sides, 12 x 4 1/2 x 1/8 in.; ends, 6 1/2 x 4 1/2 x 3/8 in.; bottoms, 12 x 6 3/4 x 1/8 in. 10 gross lots No. 10, sides, 14 1/2 x 4 1/2 x 1/8 in.; ends, 6 1/2 x 4 1/2 x 3/8 in.; bottoms, 14 1/2 x 6 3/4 x 1/8 in. Australia.

260. Particulars, prices, etc., wanted of a new gun and blasting powder, invented by Mr. Hengst—, Sydney.

261. Parties wanted, to arrange for a private brand of oil. Sydney.

262. Parties want samples of cotton oil products, said to take place of lard and keep in hot climate. Queensland.

263. Machines for making chocolate, candies, liquorice drops and lozenges. Machine for marmalade cutting. Queensland.

264. Wants to be put in correspondence with manufacturer of McLean's Sweat Collars. Brisbane.

GENERAL MINING NEWS.

Two suits of unusual importance have been begun in the United States Court at Denver by Chicago attorneys who represent John V. Farwell. The suits are against Thomas J. Cooper—one for \$500,000 and the other for \$100,000. In the first case attachments to secure the amount were made of 41,666 shares of stock in the Marion Mining Company, of Leadville, Colo., and a garnishment was served on M. B. Carpenter, the vice-president of the company, who holds the stock in trust. The second case is brought to recover the \$100,000 which is part of Farwell's investment in the Mayflower Mining Company, of Idaho, and for which amount Cooper is alleged to have guaranteed Farwell against loss.

Shipments of iron ore from the mines of the district mentioned below for the season up to and including September 25th, as reported by the Marquette, Mich., Mining Journal, were as follows:

	Tons.	Tons.
Marquette, Marquette District....	1,106,851	1,888,188
St. Ignace, " " " " " " " "	38,254	91,311
Escanaba, " " " " " " " "	739,694	620,874
Gladstone, " " " " " " " "	14,950
Menominee District.....	34,184
Escanaba, " " " " " " " "	1,243,219	791,744
Gogebic District.....	208,187	133,096
Ashland, " " " " " " " "	1,203,462	822,501
Two Harbors, Vermillion District.	653,453	279,186
Total, tons.....	5,248,254	3,330,924

*The shipments from Gladstone, Marquette District, are shipments from the Republic mine, and from Gladstone, Menominee District, shipments from the Chapin and Ludington mines.

ALABAMA.

Preparations are being made to develop extensive deposits of clay about 150 miles from Memphis, near Margerum Station, in this State, just south of the Mississippi line. Analyses of the deposit are said to show the following: No. 1, water and organic matter, 6.81 per cent.; silica, 80.07; alumina, 11.46; ferric oxide, 0.57; lime, 0.12; magnesia, 0.37; undetermined matter and loss, 0.60; total, 100.00; Kaolin base, 98.34; impurities, 1.66 per cent. No. 2, silica, 48.19; alumina, 39.864; water, 03.277; magnesia, 01.133; lime, 02.177; alkalies, 04.111; organic matter, 01.246.

ARKANSAS.

MARTIN COUNTY.

[From an Occasional Correspondent.]

Yellville, Sept. 30.

There is news of interest from the Rush Creek Camp. Messrs. Albright & Co. recently bought a tract of 80 acres for \$10,000 dollars. This takes in part of the mountain between Rush and Clabber Creeks, and has superior water power on it.

The mining company at the mouth of Boat and Cedar Creeks commenced work again with the sturdy old McRae in front and other good men used to the camp. Mr. L. Marchal will conduct the work as superintendent.

ARKANSAS MINING AND INVESTMENT COMPANY.—This company has quit work in its shaft on Clabber Creek at 55 feet, with good indications in the bottom. Mr. Murto, the efficient and able superintendent, is doing assessment work on this company's numerous claims.

BUFFALO ZINC AND COPPER COMPANY.—This company has not commenced work, but will resume soon.

ARIZONA.

MOHAVE COUNTY.

YUCCA MINING COMPANY.—This company has been incorporated in New York under the laws of New York State, with a capital stock of \$100,000. The trustees are Joseph Van Vleck, the treasurer of the Copper Queen Consolidated Mining Company; E. Coleman, E. Coffin, Jr., Charles W. Parsons and George Notman.

YAVAPAI COUNTY.

HACKBERRY MINING COMPANY.—This company has been organized in New York City with a capital stock of \$250,000. The trustees are the same as those of the Yucca Mining Company named above.

CALIFORNIA.

SAN BERNARDINO COUNTY.

CRUICKSHANK.—It is reported that a new 10-stamp mill is now being erected at this mine of Los Buenos district, to the sale of which we referred in our issue of September 21st.

COLORADO.

CRYSTAL RIVER MINING COMPANY.—This company has been incorporated by John T. Johnston, W. H. Mansur, Archie McVey, John Kinkaid, E. P. Shove and C. W. Shores. The capital stock is fixed at \$500,000. Operations, will be conducted in Colorado, with offices in Denver, St. Louis and Chillicothe, Missouri.

CUSTER COUNTY.

GEYSER MINING AND MILLING COMPANY.—In conversation with a representative of the ENGINEERING AND MINING JOURNAL this week, Mr. S. G. Doran, one of the largest New York stockholders of the company, said: "Our work has been delayed during the summer by a washout on the Denver & Rio Grande Railway, which has delayed the arrival of a portion of our machinery, but everything is now in shape for active operations. A letter from Mr. C. B. Johnson, the superintendent, dated September 23d, informs me that the main shaft, which has already reached the depth of 425 feet, will be sunk to 500 feet. The company is in good financial condition. Its sole indebtedness consists of bonds, which have been issued to the amount of \$12,000 or \$15,000 to provide funds for development work. In addition to this, 22,871 shares of stock have been sold at \$1 per share for the same purpose. The annual stockholders' meeting, which was to be held on September 19th, has been postponed until October 31st, when it will take place at Silver Cliff, Colo. The present board of directors consists of the following gentlemen: A. A. Rowe, of Boston; A. L. Brown, Whitefield, N. H.; Edwin Prescott, Boston; S. G. Doran, New York; John H. Norton, Boston; C. B. Johnson, Colorado; C. H. North, Boston. Mr. Rowe is President; Mr. Norton, Vice President; Mr. James W. Cartwright, Secretary and Treasurer. Messrs. Brown, Norton and Prescott constitute the Executive Committee of the board. The 'Dr. R. C. Flower element' has been eliminated entirely from the enterprise."

EAGLE COUNTY.

LITTLE CHIEF.—This mine, which was worked in the early days of Battle Mountain, a short time ago was started up under a new company, composed of St. Louis capitalists. A new incline was run, and at a depth of 150 feet the old workings were cut. A body of sand carbonates was found lying in a perfect channel in the lime, and cut by a drift showing 40 feet wide of ore, with no top or bottom, while along the channel it was exploited some 70 feet. The ore is a gray and brown sand, and the channel is supposed to be a continuation of the ore struck on surface while grading for the engine house, 325 feet distant, and is 500 feet from the mouth of the old incline. Several tons of ore are on the dump and 30 tons lie in the mine broken. The other work going on is progressing rapidly and several buildings are being erected. The incline will now be run on the old incline at a greater angle, so as to cut the sulphides at a good depth.

SILVER BELLE.—This mine, one of the oldest producing properties of the Red Mountain district, although idle for the past three years, is now being put in shape to resume operations. It was located in 1864, says the Denver Republican, by W. H. Harvey, now of Pueblo, and during the following summer was the largest producer in the entire district. But it was finally closed down and abandoned entirely, not because the ore body was pinched out, but for the reason that it led into an adjoining claim, the Gertie H., owned by the Dutton Bros., of Ouray. This spring the mine was sold at United States' marshal's sale, and was bid in by Alvin J. Dutton, representing himself and the above-mentioned bank, for the sum of \$75,500. The other debts against the Belle were paid by the purchasers, who took immediate steps to renew work on the mine. Since operations were suspended the buildings have gone to ruin, and the entire workings of this once famous producer are now filled with water. The new owners have recently let a contract to Mr. William Finch, of Ouray, to erect a \$25,000 pumping and hoisting plant.

YANKEE GIRL MINING COMPANY.—Mr. Thomas Guinan, a former foreman of this company, has, with others, secured a lease on the Yankee Girl dump, and has just commenced the erection of a 40-ton capacity concentrator. Ernest, Craig & Co., of Pittsburgh, are Mr. Guinan's partners in the enterprise.

LAKE COUNTY.

LITTLE CHIEF MINING COMPANY.—At the annual meeting of the stockholders, held at No. 45 Broadway, New York City, October 1st, the old board of trustees were re-elected. The board now consists of Messrs. Thos. Pitbladdo, R. L. Brower, Edw. Earle and E. C.

Kimball. Mr. Pitbladdo was subsequently re-elected President; Mr. Brower, Vice-President; and Mr. Earle, Secretary. The treasurer's report showed a cash balance on the 1st inst. of \$14,000, and in August the profits from current operations were \$500, which, we understand, is the largest amount made in any month this year. Nearly all of the Little Pittsburg property which this company recently acquired has now been leased out, as is also the Little Chief.

WARD CONSOLIDATED MINING COMPANY.—Concerning this company, our Leadville correspondent writes as follows: "The late manipulations of this stock should not be stigmatized as a swindle, but there is evidently an effort to give an appearance of greater value to the property than it actually merits. They own about twelve acres, half of which is leased to the Roundbrush Leasing Company, but work on this has been suspended for some time, and the lease is forfeited. The other half is being worked under lease by the Lee Basin Mining Company, and the royalties average about \$2,800 per month. During 1888 the company received about \$55,000, and while their receipts will not aggregate as much this year, there is an even chance of their being larger next year. At the same time the average is so small, and its probabilities are now so well understood, that the probabilities of any considerable increase is not at all flattering. The item in the *ENGINEERING AND MINING JOURNAL* of August 24th gave the impression that the company had an income for July of about \$25,000, and this is calculated to induce the public to buy stock at too high a figure. Their receipts for July were probably about \$2,000—at least not over that from royalty on ore sold. Messrs. Dominick & Dickerman represent the company in New York."

The statement in the *ENGINEERING AND MINING JOURNAL* of August 24th, to which our correspondent referred, was taken from a statement on file at the New York Consolidated Stock and Petroleum Exchange. The New York office of the company is at No. 53 Broadway.

OURAY COUNTY.

GENESSEE-VANDERBILT MINING COMPANY.—A meeting is to be held for the purpose of deciding upon a plan for raising money to relieve the mine of debt and continue the work of development. The whole burden of the expense of working this property since the company has been organized, says the *St. Louis Republic*, has been borne by nine of the gentlemen who are most largely interested, and who have contributed between \$65,000 and \$75,000 toward the work of development so far done. The property, including the Genessee claim, originally cost \$170,000, and all but \$30,000 has been paid. At the time the company was organized there were 200,000 shares of stock, which was for sale at \$2.50 per share. Of this stock only 12,000 shares have been disposed of. The company now sees its mistake in placing so high a figure on this stock, and as it is not its desire to reorganize upon a lower basis, it has decided to make an appeal to the stockholders to assist it in its need.

[From a Special Correspondent.]

AMERICAN BELLE.—This mine, at Red Mountain, has just completed a 300-foot shaft and begun cross-cutting to ore chutes.

GUSTON.—This mine owned by the New Guston Company, Limited, of London, England, is the heaviest shipper in the section, producing 350 to 450 tons per month. The shaft is 400 feet deep. A new direct-acting hoisting plant is now being made by Fraser & Chalmers, to be placed on the mine this fall. It will be a double 14 x 48 engine, and one of the largest in the State. The mine has been a regular dividend-paying property since the present superintendent, T. E. Schwarz, took charge, a year ago, of the then abandoned mine.

NORTH STAR.—This mine on Sultan Mountain is producing well from the drifts and stopes from the lower tunnel level. Ore is a galena and gray copper, carrying 40 to 70 ounces silver.

PAYMASTER.—This property, near Ironton, owned by New Haven capital, is producing some ore from the third level. Have recently shipped a few car loads to Durango smelter. Ore carries ruby silver, as enriching mineral with galena. F. Dury, part owner and manager.

PYRAMID.—This mine is located on the well-known "Letter G" vein, and is being developed by Captain Freeman and friends, of New York.

RED MOUNTAIN VANDERBILT COMPANY.—This company, of St. Louis, a year since a very active stock on the St. Louis board, and owning the Vanderbilt and Genessee mines on Red Mountain, have suspended operations. We understand an effort is being made to raise funds to reach greater depth.

SILVER CROWN.—This mine, located near Chattanooga, seven miles from Silverton, has a very strong vein carrying large surface showing of low grade galena. It is, however, totally undeveloped beyond some surface cuts.

YANKEE GIRL.—This property is producing two cars per week. The company is building a concentrator for its accumulated low grade ores. In the *ENGINEERING AND MINING JOURNAL* of August 31st mention was made of a discovery of an ore body by the new superintendent, said to be the main body to the stringer which was worked out by Mr. T. E. Schwarz, the late superintendent, in 1885. This inferentially does an injustice to Mr. Schwarz, who is an engineer of no little ability. The ore referred to was left by him in old workings to support mine stations and main shaft, and cannot be termed a new ore body.

PITKIN COUNTY.

According to the *Aspen Times*, a contract has been closed between the Mollie Gibson Mining and Milling Company and the Smuggler Mining Company, by which the former is to concentrate 2,000 tons of Smuggler ore. This results from the handling of 200 tons of Smuggler by the Gibson mill a short time ago, in which three and a half tons of low grade ore were concentrated into one ton, returning 40 ounces silver and 38 per cent. lead.

ASPEN CITY.—A number of St. Louis gentlemen are reported to have purchased an interest in this mine, a property located within the corporate limits of the city of Aspen. The mine was located in May of this year. It is situated immediately between the Mollie Gibson on the northeast and the Enterprise on the southeast, the end line of the Aspen City joining the end lines of both the above properties. A two-compartment shaft has been sunk to a depth of 90 feet, and it is expected to strike the contact at a depth of 200 feet.

ASPEN UNITED MINING AND MILLING COMPANY.—This company, it is said, will soon list its properties on the Denver Exchange. These properties comprise the Sunset, located in the Maroon district; Aspen, a large producer; the Unexpected, in Tourtelotte Park; the Panama and Wyandotte. Mr. Humphrey is secretary and general manager of the above properties.

SAN JUAN COUNTY.

TITUSVILLE.—It is announced that this mine, on Kendall Mountain, has been sold by Thomas M. Trippe to St. Louis parties for \$250,000.

DAKOTA.

Andrew Moss has succeeded in interesting New York and Pittsburg parties in a group of mine quartz locations situated partly in the Bald Mountain and Whitewood districts, says the *Deadwood Times*. A corporation consisting of the following gentlemen has been formed under the Dakota laws: H. C. Avery, Thos. Brown, Jas. Deeds, B. Blakewell, Jno. Snee, C. Taze, E. Wilson, T. W. Erwin, Andrew Moss. The capital stock is \$1,250,000, shares \$5 each.

LAWRENCE COUNTY.

DEADWOOD-TERRA MINING COMPANY.—Messrs. Lounsbury & Co. inform us that the product of this company for August was \$39,110. The amount of ore crushed was 20,540 tons, a falling off of about 9,000 tons from the average amount crushed during the last fiscal year. This decrease is due to the shutting down of the Terra mill of 80 stamps on July 16th in order that the Deadwood and Terra mills might be combined and 40 stamps added. This work is now in progress, and when completed will give the company 200 stamps under one roof. The company is also using the Father De Smet mill of 100 stamps. During the fiscal year ending July 1st, 1889, Messrs. Lounsbury & Co. inform us that the total amount of ore crushed was 349,008 tons, from which \$682,804.56 was realized. The average grade of the ore per ton was \$1.96.

IRON HILL MINING COMPANY.—The official statement shows that the bullion production for August had a net value of \$46,331.06. The resignation of Col. C. W. Carpenter as a director was accepted, and Meyer Wheeler, of Chicago, a heavy stockholder, appointed to the vacancy. Seth Bullock has gone to Aurora, Ill., and St. Louis, Mo., intending to make arrangements for shipment to the former place of matte produced by the Iron Hill smelter when running on pyrites a short time since.

SEABURY-CALKINS CONSOLIDATED MINING COMPANY.—The six cars of ore recently shipped to the Kansas City Smelting and Refining Company, at Kansas City, it is said, averaged about \$60 per ton in gold and \$5 in silver. There is more high-grade ore ready for shipment, which will go forward as soon as returns are received on the last lot. Work continues at the mine.

SPANISH R. MINING COMPANY.—This company's shipments to Kansas City average, it is said, about three carloads of ore per week. Work is now going on in the 100 and 170 foot levels, and some rich, soft carbonate ore is being taken out.

IDAHO.

LEMHI COUNTY.

VIOLA COMPANY, LIMITED.—A recent report of the manager states: "We have stopped work in the old Viola claim. We are now working in Westmoreland level and doing yearly assessment work on our unpatented claims—Mary Ann, Carbonate, Excelsior, New Translation and Annex."

ILLINOIS.

ILLINOIS COAL AND COKE COMPANY.—It is reported that the strike of this company's miners in the Peoria district has been settled by arbitration. The company consents to pay 70 cents per ton.

HARDIN COUNTY.

By an error in our issue of September 14th the Pell Fluor Spar Mining Company, of this county, was located in Dakota in place of Illinois.

(From an Occasional Correspondent.)

Since writing you, "The Ohio Valley Flux and Iron Company," of Rosiclare, Hardin Co., Ill., has sprung into existence, ostensibly for the manufacture of the "Henry Glass Patented Chemical Flux for Iron and Ores." This new flux, it is said, is a wonderful product, and the only flux ever discovered of marked affinity for the silicon, silica, phosphorus and sulphur contained in iron and other metals. As a consequence, there is

much excitement created over this discovery where the flux has been tested, and the demand for an immediate supply from some of the largest foundries and pipe works in the country is so urgent that the ground floor is being laid by Dr. Glass and his friends for an extended manufacture of the article. In a recent test of this flux in Louisville, testimonials from responsible and reliable foundrymen assert that castings were taken from the molds so soft as to be drilled by a hand drill, and so malleable as to be bent in a vise by blows from a hammer like wrought iron. Also, that the texture of the iron was much finer and stronger and tougher than usual, and breakage in the cooling process was entirely avoided; also, that the runs were made at much less expense than by any other flux, and a large saving of fuel and no sparks to put out the eyes of the men.

It is further stated that six pounds of this material will thoroughly flux a ton of common pig iron to the last drop of iron in it, and leave the cupola perfectly clean and all ready for steady running day after day; ten pounds will do the same thing for a ton of the commonest and poorest scrap iron. If one-half of what is said about this new flux is true, it is indeed a boon to foundrymen, as it insures to them perfect castings every time they are lifted from the molds—no flaws, no blemishes, no sand holes to mar or destroy the fruits of their labor. The materials composing this new flux are said to be rare and valuable minerals found in this section only, and are combined in certain proportions and reduced to a powder and applied wet, six to ten pounds to a ton of metal. The application is perfectly simple, and no damage or danger can possibly result from its use, but, on the contrary, immense satisfaction and pecuniary benefit.

MARYLAND.

ALLEGHENY COUNTY.

UNION MINING COMPANY.—At a special meeting of this company held in Baltimore, General Gilmor Meredith was elected a director in place of James Roosevelt, of New York, resigned.

MICHIGAN.

MICHIGAN GOLD MINING COMPANY.—This company has been doing but little work on its property on the Ishpeming gold range, says the *Marquette Mining Journal*, owing to the uncertainty growing out of the litigation over the title, which will only be removed by the decision of the Supreme Court, soon to be rendered. Recently, however, it was determined to unwater one of the shafts and to resume work with a light force, so as to have everything in readiness to push work in case the issue of the suit shall be favorable to the company.

COPPER MINES.

PENINSULA MINING COMPANY.—A second head of stamps has been started at this mine, which, according to a lake paper, will probably increase the output to about 100 tons per month.

TAMARACK MINING COMPANY.—At the stockholders' meeting in Boston on the 3d inst. the annual reports published in the *ENGINEERING AND MINING JOURNAL* last week were presented and the following board of directors was elected: Joseph W. Clark, of Connecticut; A. W. Spencer, Edward S. Grew, George F. Bemis, John N. Dennison, all of Massachusetts; Franklin Fairbanks, of Vermont; John Daniell, of Michigan. Secretary and Treasurer, R. S. Bigelow.

IRON MINES.

[From a Special Correspondent.]

Concerning the mines which Mr. Ferdinand Schlessinger is reported to have bought for a Berlin syndicate, as noted in the *ENGINEERING AND MINING JOURNAL* of September 21st and 28th, I may say that although rumor says Schlessinger bought the Bessie mine near Humboldt, I cannot find out who bought it. I asked the owner, who replied "A man from Chicago has an option." But the mine is not worth the comment it is receiving. It is located some distance north of the town of Humboldt (say 1½ miles), and upon the northern edge of the basin, the southern edge of which holds the old Washington, Samson and Baron mines. A peculiarity is that the ore is a soft blue hematite with an admixture of hard steel ore, while those named are "hard" ores. I understand it hovers in the ragged edge of the Bessemer limit in its phosphorous contents. The development is limited, consisting of a number of small test pits of varying depth, some showing ore, others black slates, caprock or ledge material, as the case may be. It is a fair prospect, not a mine, as the deepest shaft is about 60 feet. I don't think there's any machinery on the ground, which is an 80-acre tract leased from the Michigan Iron and Land Company. The examination reported in local papers as being made for Schlessinger, upon the Buffalo, South Buffalo, Queen and Prince of Wales mines, was made for a Chicago party. The mines are good ones, but the price asked for the leases was considered too high. The Queen mine is remarkable in its record, and when more fully developed by a shaft now sinking will make a place for itself among the "big ones." It is about two years old, shipped about 60,000 tons from its only shaft this year, is free of debt and will pay a handsome dividend.

In our issue of September 28th a typographical error made the price at which the Prince of Wales and Queen, Buffalo and South Buffalo mines were held at \$75,000 in place of \$750,000, as it should have been.

CHAPIN.—At the Chapin the ore is still being sent to surface rapidly, and the 50,000 tons of last month will be equaled if not exceeded by the output of this

month. The new timber shaft (so called) near the company's machine shops, is going down slowly, and crosscuts have been driven from the 4th, 5th, and 6th levels, a distance of about 170 feet, to the line of this new shaft and the shaft will be "raised to" at each level. When completed the shaft together with "D" shaft, will serve as outlets for the ore from the west end of the mine. The ground above the sixth level and east of the present terminus of the rope haulage, which has all been more or less affected by the caves which have taken place at different times, will all be worked out and filled by the system for some time in force, but the new ground west of and below the present sixth level will be mined by the new system lately decided upon, except that below this sixth level where the ground has been crushed a level of 100 feet of ore will be left intact, for the purpose of increasing the stability and safety of the mine, and instead of opening out and working the 7th levels of the present working shafts they will be continued to the 8th and stoped from there to the 7th.

The arrangements made will dispense with the use of timber except in places where a soft seam of ore is encountered. That the Chapin is destined, should its owners see fit to test its capacity, to produce a million tons in one year can hardly be doubted. When the preparations now being made are completed, it will be no trouble to hoist 100,000 tons per month through the four shafts, B, C, D and the new five compartment shaft, and as to its being mined there need be no question. It may not be generally understood that there is a large lens of ore on the Coapin property which has never been wrought, but the future will disclose this fact.—*Exchange*.

HANCOCK IRON MINING COMPANY.—The directors of this company have decided to suspend operations—the sinking of the shaft—until the assessment of 10 cents a share, due on about 10,000 shares of stock, is paid up, or until the stock is closed out, after which the work of sinking to the ore body will be continued.

MILWAUKEE & SUPERIOR MINING COMPANY.—Messrs. John S. George, Francis Boyd, John Black, H. M. Benjamin, and Thomas Shea incorporated this company, with a capital stock of \$250,000. The company has purchased the Superior mine on the Gogebic range from Robert Nunemacher, who purchased it at sheriff's sale recently, on behalf of creditors of the property, and will work it. The same gentlemen were the leading members of the old company which owned the mine before it was purchased by Mr. Nunemacher.

MINNESOTA.

ST. LOUIS COUNTY.

MINNESOTA IRON MINE.—Of the extensive improvements on this property the new compressor house is perhaps the greatest, and when completed will contain the most powerful machinery yet introduced on the Vermilion range. The building itself is 75 feet by 58 feet, 16 feet under the eaves, the floor being built of steel I-beams, between which are brick arches in concrete, the whole covered by a layer of cement. The smoke stack is circular, 64-inch flue, built of brick on an octagon base 17 feet high, constructed entirely of quartzite stone. Its total height from fire plate is exactly 100 feet. The machinery in the engine room consists first, of two pairs of E. Reynolds Corliss engines, built by E. P. Allis & Co., of Milwaukee. They have a high pressure cylinder 18 inches in diameter, low pressure 36 inches, and an air cylinder 20 inches in diameter. They have a stroke of 48 inches and the fly wheels are 18 feet in diameter, and each weigh 18 tons. At sixty revolutions per minute these engines would each develop 400 horse power, and could be run to give 500. The main air pipe, which conveys the air from the engines to the smaller pipes, and subsequently to the drills, is 14 inches in diameter. Besides these two condensers there will be put in the building a non-condensing engine having 20-inch steam, 20 inch air and 30-inch stroke, to be used in case of necessity. In addition to this there are two water pumps for supplying water to the mines, and for boiler purposes, discharging through a 5-inch water main.

In the boiler room are three vertical tubular boilers of the Reynolds pattern, and are also furnished by E. P. Allis & Co., of Milwaukee. The shells are 18 feet long, 84 inches in diameter, and each one contains 203 two and a half inch tubes, 12 feet long. This gives a heating surface of 1,563 square feet. Each boiler is designed to carry 110 pounds steam pressure, and has 156 horse power.

Almost directly south of the Ely pit a new brick building has been built, which is to contain the new hoisting engines now on the ground ready to put in. The building is 115 feet long by 48 feet wide, 69 feet of its length being taken up by the engine room and the remaining 45 feet by the boiler room. It is built on the same plan as the compressor building, with a truss roof and fire proof floors. At the east end is a circular smoke-stack. It has a 61-inch flue and is 63 feet high, which together with its 17-foot stone base, gives it a total height of 80 feet from the grate surface. The machinery in the engine-room consists of two 18x48-inch Reynolds Corliss engines, of the E. P. Allis & Co. manufacture; two 8-foot hoisting drums, furnished by Webster, Camp & Lane, of Akron, Ohio; one 11x20-inch Buckeye engine used for electric light purposes, and two dynamos of the arc light system. In the boiler room are the four horizontal tubular boilers, 60 inches in diameter and 16 feet long, which will furnish the steam to these en-

gines. Each boiler has fifty-four 4-inch tubes and is supplied with Reynolds' feed water heater. Such are the improvements and additions now being made by a company, which has each year doubled the former year's output. Besides all this a track will be built around the west end of the property to the Montana shaft on the north side. Six diamond drills are constantly at work, besides several crews on testpitting.

The work of setting machinery is being rapidly pushed forward, and the plant will be in working order about the first of December.

MISSOURI.

CHICK-SHORT METHOD SMELTING AND REFINING COMPANY.—This company has been organized at Kansas City, Mo., and has been granted a charter by the Secretary of State of Kansas. The capital is \$15,000,000. The purpose is to build a large refinery in Kansas City, Mo. The directors of the company are: David J. Brewer, Thomas Storms and Nelson Acres, of Lavenworth, Kan.; George H. Glick, of San Francisco, Cal.; John H. Knell, William H. Whiteside and Marvin R. King, of Kansas City.

MONTANA.

BEAVERHEAD COUNTY.

CARLISLE GOLD MINING COMPANY.—It is reported that this company, an English corporation, has purchased the Phil Shenon mines for \$175,000. Sixteen full claims comprise the group, the principal one of which is the Golden Leaf, upon which a ten-stamp mill has been erected, and which, according to a Montana paper, has yielded large returns. The first payment has been made and deeds placed in escrow with Clark & Larabie. Mr. J. Stewart Wallace, one of the directors of the company, acted as its agent in the purchase, and Mr. W. N. Symington, of New York, and Mr. G. B. Eustice, manager of the company's works at Carlisle, made the examination and report upon which the sale was consummated.

JEFFERSON COUNTY.

LITTLE ALMA.—This mine, located on Shoofly Mountain, in the Upper Basin country, near the confluence of the Basin and Eureka creeks, in this county, has been bonded to O. P. Chisholm, of Chicago, Ill., and Professor Barnhart, of Cleveland, O. The bond, according to the *Helena Mining Review*, runs until September 1st, 1890, and is for the sum of \$80,000. A contract has been let for the running of a tunnel to be known as No. 2 tunnel, for a distance of 400 feet, or until it taps the vein. Tunnel No. 1 is now in on the vein 380 feet, the last 150 feet in ore along the hanging wall. A cross-cut has also been driven for the foot wall forty-three feet without yet finding it. This cross-cut is in ore the entire distance. A second cross-cut has also been driven about thirty feet diagonally across the vein, in ore, but without finding the foot wall. Tunnel No. 2 will open the mine about 150 feet deeper than the present workings.

LEWIS AND CLARKE COUNTY.

NEW STATE MINING COMPANY.—This company, which has just been organized, is composed entirely of Helena capitalists. Among those interested are Messrs. Childs and Beatty. Control has been secured of the Vulcan lode. Preliminary work has already been commenced. Mr. Aleck Swan, who opened up the Gloucester mine, has been secured as superintendent and manager.

SILVER BOW COUNTY.

GOLDEN MESSENGER MINING COMPANY.—New York Gulch, an old placer mining district, is just now the scene of active operations, this company, to which we referred in the *ENGINEERING AND MINING JOURNAL* of August 17th, being the principal one working in the district. The property includes five locations, among them the Golden Messenger and Little Dandy, which have been worked for three years, but now a large force is employed. A new mill is to be built and will shortly be in operation. The capacity will be 20 tons daily. The Little Dandy is developed by a 160-foot shaft and level run at that depth, from which more than 500 tons of ore have been extracted. The lead has also been opened up 1 500 feet on the surface by cuts showing it to be from two to four feet wide. The Golden Messenger is developed by a 70-foot shaft and several openings in which a four-foot vein is exposed, worth \$15 per ton, the ore being free milling.

MOODY & SANKEY MINE.—A syndicate composed of B. J. Fine and other St. Louis capitalists has secured control of this mine in Brown's gulch, north of Burlington. A shaft is being sunk, and is now down 170 feet. The mine has lain idle for the last six years.

SOUTHERN CROSS MINING COMPANY.—The following officers have been elected: President, Ben G. Harris; Vice-President, Salton Cameron; Treasurer, J. W. Fairfield; Secretary, Guy X. Piatt. A cross-cut on the lead on the 150-foot level, to which we referred last week, has been started about 225 feet from the shaft. This level is in ore all the way, and the cross-cut has run 8 feet into ore, and the foot wall has not yet been reached. As soon as the lead has been entirely cross-cut, the 250-foot level, which is now extended 115 feet west, will be carried out 225 feet and the lead cross-cut at that point. The 10-stamp mill will begin operations next month.

TIGER.—An interest in this mine, located about 14 miles south of Butte, near the Highland district, has been sold to Eastern parties. Contract has been let for the sinking of a 200-foot shaft and work upon it will begin immediately. It is said that it is the intention of the company to erect a mill as soon as development will warrant it.

NEVADA.

ELKO COUNTY.

COMMONWEALTH MINING COMPANY.—The changes to the concentrating plant of this company, at Tuscarora, will be completed, it is thought, during the first half of October, and the work of ore production will then be resumed.

GRAND PRIZE MINING COMPANY.—At the annual meeting of this company held in San Francisco on the 18th ult., the old management was re-elected without opposition. In his annual report to the stockholders Superintendent Coffin says: "The water has been lowered from the 300 to the 400-foot level, and is being lowered now to the 500-foot level. After the water was lowered to the 400-foot level the ore showing in the winze 35 feet below the 300-foot level was followed on down to the 400-foot level, at which point the water was again encountered, and further development in a downward direction stopped. Here the vein was good, showing 18 inches of high-grade ore, 90 tons extracted and milled averaging \$283 82 per ton, and yielding in bullion \$19,407.64. During the extraction of this there was also a large amount of concentrating ore taken out and piled on the dump. The above mentioned ore body gives promise of developing well, both in quality and quantity, on the 500 foot level; likewise that in the south drift below the 400-level. Three thousand one hundred feet of drift is now open and ready for extraction of concentrating ore; some is averaging in width from two to five feet, and extending from the 400 up to the 200-foot level, and assaying from \$15 to \$50 per ton, besides which there is a large amount now on the surface. After the plant now being put in is finished the company will be enabled to work the large amount of low-grade ore now in sight profitably. The water nearly out to the 500-foot level, and the concentration plant soon to be finished and in operation, will mean a reduction in expenses and a source of revenue in its stead during the ensuing year.

ESMERALDA COUNTY.

CATHERWOOD.—It is reported that these mines, in Palmetto district, are being developed by New York capital.

EUREKA COUNTY.

Letters received by private parties from Eureka District, says the *San Francisco Report*, state that trouble is brewing for the Richmond Consolidated Mining Company. It is said that they have recently extended their workings into Eureka Consolidated ground, and have been detected. The Eureka Consolidated people are reticent about the matter, but it is believed that the rumor is true, and that there is liable to be some litigation between the companies if the trespassing continues.

CORTEZ MINES, LIMITED.—The results for August are: Production, 40,385 ounces; expenses, \$20,000; tons crushed, 810.

HUMBOLDT COUNTY.

ANTIMONY MINES.—Dr. H. H. Hutchings, who represents an Eastern company, is engaged in developing antimony mines near Black Knob, below Sacramento Cañon, in the Humboldt Range. According to local papers, he has seven or eight men employed, and expects to increase the force shortly to seventeen men. He has two or three hundred tons of ore on the dump. He intends to reduce the ore on the ground, and for that purpose is erecting a smelting furnace.

RABBIT HOLE.—It is reported that C. S. Wright is preparing to refine sulphur at these mines, owned by Alex. Wise, which, it is said, have produced hundreds of tons of brimstone.

LYON COUNTY.

LACRUITZ.—Mr. J. B. Dazet, one of the principal owners of this mine, in Silver City, is about to erect a five stamp mill operated by steam.

STOREY COUNTY—COMSTOCK LODGE.

In reference to the suit brought against the ranchers of Carson Valley by the Union Mill and Mining Company for appropriating too much of the water of the Carson River, to which we referred in our last issue, the ranchers held a meeting at Genoa, Nev., on the 23d ult., and a committee was appointed to confer with the Union Mill and Mining Company and request that company to withdraw its suit against the ranchers. The ranchers prefer to build storage reservoirs than to go to law. It is said that the Union Mill and Mining Company will not consent to such terms of a compromise, taking the ground that it held property along the river before there were any ranches, and is, therefore, entitled to the full use of the water. The ranchers have agreed to raise funds to fight the Union Company in the courts if it does not accept the proffered terms.

ALTA MINING COMPANY.—The five stamps recently added to the former complement of the mill were in operation for the first time on the 23d ult., and there are now fifteen stamps dropping on ore from the mine with a crushing capacity of 50 tons daily. This, it is said, will increase the bullion output nearly \$80,000 monthly.

CONSOLIDATED NEW YORK MINING COMPANY.—This company is negotiating for the lease of the Douglas mill in Gold Hill, and it is said will soon begin shipping ore there. There is a large area of ore stripped between the 600 and 800 foot levels of the mine, which is being added to as explorations are advanced. Some of this ore is high grade. The mine will make the fourth mine in the south end added to the bullion producing list on the Comstock, the yield of which will increase the gold and silver product of the lode above \$80,000 monthly.

NORTH OCCIDENTAL GOLD AND SILVER MINING COMPANY.—At the annual meeting of this company, held in San Francisco recently, the following officers were elected for the ensuing year: President, George R. Wells; Vice-President, H. Zadig; Trustees, Mark Struce, Fred Nichols and P. N. Schlesinger. W. H. Watson was re-elected Secretary and J. H. Kincaid was appointed Superintendent.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—During August this mine produced 1,642 tons of ore, yielding bullion valued at \$13,060.82, of which \$11,308.65 was silver and \$1,732.17 was gold. In addition to the above, concentrates valued at \$12,175 were produced, making a total yield for that month of \$25,235.82. The yield of the concentrates in gold was \$4,521 and \$7,654 in silver. The average assay value of battery samples was \$18.16 per ton, and the average bullion yield \$15.42 per ton—an average of 84 per cent. of the assay value of the ore being returned in bullion. This was the first month's run of the new 20-stamp mill after its completion. The concentrates are to be shipped to Salt Lake City and sold. The product of the mine paid something more than the month's expenses, which is quite satisfactory when it is considered that the mill was new and the class of ore worked was not high.

P. J. KEYES MINING COMPANY.—The shareholder of this mine are not at present on a bed of roses by any means, and the position of the company on the eve of an assessment collection, says the *San Francisco Post* is not as favorable as might be desired by the officials who have been living from hand to mouth for months past on the funds scraped up among parties heavily interested in the success of the enterprise. Unless the amount now raked in from the few outside holders of the stock is much heavier than it was before, there is little prospect of it going very far in settling back bills or in providing for the necessary legal talent in a heavy law suit, which threatens to swamp the company. Within the week a Virginia lawyer has been collecting affidavits in town to be used in the suit of P. J. Keyes, the original owner of the property, for back salary due him as superintendent. This litigation, however, will not be a patch on that which threatens in another quarter, and in which the service of papers may be made at any moment. The complaint filed will be full of interesting details concerning the inner workings of the company in its earlier days, and will be of service in exposing to the public the arrangements under which such enterprises are floated. It is difficult to conceive the hardihood of any set of officials in daring to make an arbitrary collection of funds from outside shareholders without first acquainting them with the true position of the company's affairs. The total sum demanded cannot go far anyway, and it is not likely that shareholders would sustain a cut without first taking some steps to assure themselves of an actual and undisputed possession of the mine.

NEW YORK.

CATTARAUGUS COUNTY.

The strike of oil at a depth of 800 feet on a farm a short distance south of Alleghany is reported. The oil was struck in the second sand. Other wells are to be drilled in the territory at once.

PENNSYLVANIA.

COAL.

The Wheeler & Morrill coke plants of the Cambria Iron Company in the Connelville region, the last to remain idle from the recent strike, have resumed operations. The men return to work without the company signing the Knights of Labor scale, the company agreeing to pay the Knights of Labor rates.

The following collieries of the Schuylkill region drawn at Pottsville, Pa., to return prices for coal sold in September, 1889, to determine the rate of wages to be paid, make the following returns: Ellan-gowan Colliery (P. & R. C. & I. Co.), \$2.32⁷/₁₆; Elm-wood Colliery (P. & R. C. & I. Co.), \$2.31¹/₁₆; North Mahanoy Colliery (P. & R. C. & I. Co.), \$2.39¹/₁₆; Wm. Penn Colliery (W. H. Lewis, Supt.), \$2.29; Draper Colliery (H. L. Williams), 2 35⁷/₁₆. The average of these prices is \$2.33⁷/₁₆, and the rate of wages to be paid for work in last two weeks of September and the first two weeks of October, is five per cent. below \$2.50 basis.

LEHIGH COAL AND NAVIGATION COMPANY.—The Pottsville *Chronicle* says that ejection suits will be entered against this company for the possession of upwards of 400 acres of valuable coal lands in Rahn Township, ostensibly owned and operated by the company, and reputed to be worth \$2,000,000. About 273 acres are on Owl Mountain, and on the whole tract several collieries have been erected. The land is claimed by thirty heirs of Burkhard Moser, who died about 1808. That was before Schuylkill County was formed and the land was then in Berks County. They have formed a company and as soon as the arrangements are perfected will enter suit at Pottsville. The land is situated east and south of Tamaqua. There has been no litigation in reference to it since 1850, but the general impression exists that there is a missing link in the title. After Burkhard Moser's death it passed into the possession of John K. Smith and Richard Carter. Carter bought Smith out, and sold it to Richard Shoener, who discovered that the title was defective. He purchased the interest of several heirs, but the claims of the heirs of the 400 acres in question were not bought at the time, and there is no record of any such transaction since, unless the Coal and Navigation Company will be able to hunt up one. Shoener sold the property to the Greenwood Coal Company, an adjunct of the

Little Schuylkill Railroad and Navigation Company, and the Lehigh Coal and Navigation got possession in the '60's, or thereabouts, for \$1,002,500, through the foreclosure of a mortgage held by it.

COKE.

MCCLURE COKE COMPANY.—It is reported that this company has bought Robert Hogsett's Lemont Coke Works, situated four miles north of Uniontown, for \$131,500. The plant consists of 134 ovens, with 175 acres of coal land. Included in the purchase are 200 acres of surface, 15 acres of fire clay, with brick works, railroad sidings, store, etc. The purchasers, it is said, will erect 100 new ovens and otherwise enlarge and improve the plant. They are also negotiating for the purchase of some adjoining coal land.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to September 28th, were as follows:

	1889.	1888.
	Gals.	Gals.
From Boston.....	3,509,511	3,010,172
Philadelphia.....	110,108,158	100,564,250
Baltimore.....	5,748,611	5,641,387
Perth Amboy.....	13,190,791	16,861,272
New York.....	334,442,999	282,092,785
Total exports.....	466,800,070	388,099,866

GLOBE REFINING COMPANY.—Henry C. Terry, Esq., of Philadelphia, as solicitor for Peter A. B. Widener, George W. Elkins, George D. Widener and R. F. Bower, of Philadelphia, and Joseph W. Craig, of Pittsburg, has obtained a charter for this company, capital \$500,000, the purposes being buying, producing, storing, refining and dealing generally in petroleum and manufacturing and dealing in the products thereof.

TENNESSEE.

POLK COUNTY.

We have had several inquiries relating to the copper mines at Ducktown, and have obtained the following information from a gentleman formerly interested in these mines: "The mines have not been worked since 1878. There is no manager there, only some agents—residents of the districts—who look after the real estate. I doubt whether any systematic effort has been made to organize a company for the purchase of the mines. There have been some requests for long options of purchase, of a nature which would hardly lead to business. A railroad is now being built through the mines from Blue Ridge, on the Marietta & North Georgia Railroad, toward Knoxville. By this time the rails are laid from Blue Ridge to Ducktown or beyond. This may ultimately lead to a renewal of the working of the mines, but I know of no present organized effort in that direction."

UTAH.

CHALK CREEK MINING COMPANY.—This company has been formed for the purpose of transacting all business appertaining to the coal trade, including the buying and selling of coal lands. The company is to exist for a period of fifty years, and the principal office shall be located in Salt Lake City. The capital stock is placed at \$50,000, shares par value of 50 cents each. Ten thousand shares are held by the corporation to be sold for working capital. The officers are: O. L. Brown, President; W. W. Bowers, Vice-President; A. G. Lee, Secretary; H. P. Mason, treasurer, and these gentlemen with James Thompson, J. G. Bechtol and L. Dahlquist form the Board of Directors. The stock is unassessable for five years.

WASATCH COUNTY.

GLENCOE GOLD AND SILVER MINING COMPANY.—This company has been organized for the purpose of conducting a general mining and smelting business. It owns the Glencoe, Sofa, and Northside mining claims, all situated in Red Pine Gulch. The company is to exist for fifty years, and the capital stock is placed at \$2,500,000, shares, \$25 each, non-assessable. The officers are: M. Shaughnessy, President and Treasurer, G. S. Erb, Vice-President; H. G. McMillan, Secretary, and these gentlemen, with A. L. Thomas and J. Barnett, form the board of directors to serve for the ensuing year.

WASHINGTON TERRITORY.

[From a Special Correspondent]

OKANOGAN TERRITORY.

The town of Ruby, population 300, 108 miles northwest of Wilber, is on the line of the Washington Central Railway, running from Spokane Falls to Wilber, a distance of 80 miles. The principal mines of this district are as follows:

ARLINGTON.—Here is a 20-foot ledge between granite for foot wall and porphyry for hanging wall. The developments consist of 220-foot shaft and 400-foot cross-cut tunnel. The ore near the surface, free milling, gives a return of \$50 per ton. Below water level the ore becomes base or refractory, containing zinc blende, and iron pyrites. A 10-stamp mill using the Russell lixiviation process is in course of construction. Mr. J. B. Tonkin is superintendent. The Arlington Mining Company is organized at Portland, Ore., Mr. Jonathan Bowne, secretary.

BLACK BEAR.—Development, 75-foot shaft on 2-foot vein, carrying native gold in white quartz on Palmer Mountain, 28 miles north of Conconully.

FOURTH OF JULY.—This mine shows 30 feet between walls, showing 18 inches of solid ore carrying native, brittle and ruby silver, assaying a mill return of 200 to 500 ounces silver. Owners, P. Clark and Hussey & Taylor, of Spokane National Bank, Spokane Falls, Wash.

LONE STAR. Conconully or Salmon River district, 7 miles north of Ruby. The developments on the Lone Star consists of 300-foot shaft showing 2 feet of quartz between granite walls. The ore galena, zinc blende, copper and iron pyrites, assaying 50 ounces silver and a large percentage of lead. Mason & Lawrence, owners.

MODOC CHIEF.—This property is one mile due west of Ruby City. Development, 100-foot shaft on the vein, 2½ feet in width, showing gray and carbonate of copper and steel grained galena, assaying 100 ounces silver and 32 per cent. in lead. Messrs. A. McPherson and Murray, of Ruby City, owners.

NEW DISCOVERY.—One mile northwest of Ruby City, near Ruby Hill, two feet of quartz showing galena and carbonate of lead and copper, assaying 45 ounces silver and 15 per cent. lead. Mr. Edward McGinnis, of Aspen, Col., owner.

RUBY.—This mine is on Ruby Hill, two miles southwest of Ruby. Ten feet of ore cropping, showing gray and carbonate of copper assaying 40 ounces of silver.

WAR EAGLE.—Vein three feet between slate or shale and porphyry, showing free gold in quartz milling five ounces in gold and 45 ounces silver per ton. Hussey & Taylor, Spokane Falls, owners.

PIERCE COUNTY.

According to press reports of the 25th inst., gold has been found almost within the city limits of Tacoma, on the school section and outside of the city limits on the south section, which is more particularly described as No. 16, Township No. 20, north of range three, east. Over forty mining claims have been filed in the auditor's office. As there are but 3,220 acre tracts in the section it appears that some of the claims have been filed upon more than once. If the claims prove valuable some interesting complications will probably arise.

WISCONSIN.

WASHBURN.—The mine in the Gogebic district is now idle and closed down for repairs. Very favorable reports were issued by interested parties at the time the stock was placed on the market, but so far they do not seem to have been verified, like those of many other prospects on the Gogebic range.

FOREIGN MINING NEWS.

CENTRAL AMERICA.

HONDURAS.

ARAMECINA GOLD AND SILVER MINING COMPANY, LIMITED.—This company has been registered in London by Hugh C. Godfray, 60 Finsbury-pavement, E. C., with a capital of £200,000 in £1 shares, to acquire certain mines and mining rights at Aramecina, Honduras, and to explore, work and develop the same. The first subscribers are: H. Wethered, J. H. Howell, O. Wethered, H. L. Wethered, B. C. Godfray, A. W. Thomas, W. H. Miller.

MEXICO.

LOWER CALIFORNIA.

The Occidental mine in the Real del Castillo district of Lower California is reported to have made another shipment of \$3,000 in gold, making in all about \$14,000 which the mine has yielded in the past four months. The San Diego papers also report a shipment of \$8,000 from the Stonewall mine and \$2,600 from the International Company's mines.

ONTARIO.

CANADIAN COPPER COMPANY.—This company operating in the Sudbury district started its second Herreshoff furnace on September 4th, which has been smelting about 125 tons per day since; both it and No. 1 are running in an eminently satisfactory manner, and the mines, both in the quarry and underground work, are continuing in good ore. The Copper Cliff has attained a depth of 500 feet.

MEETINGS.

Barton & Georges Creek Valley Coal Company, Second National Bank, Cumberland, Md., October 8th, at 11 A. M.

El Paso Electric Company, Colorado Springs, Colo., October 8th, at 4 P. M.

International Portelectric Company, 254 Pearl street, New York City, October 9th, at 2 P. M.

Nevada Queen Mining Company, 309 Montgomery street, San Francisco, Cal., October 9th, at 1:30 o'clock P. M. Transfer books close October 5th.

DIVIDENDS.

Consolidated Electric Light Company, quarterly dividend of one per cent., payable October 1st.

Delaware, Lackawanna & Western Railroad, quarterly dividend of one and three-quarters per cent.

Equitable Gas Company, quarterly dividend of two per cent., payable October 15th. Transfers close October 1st.

Hazelwood Oil Company, dividend No. 39, of one and one-half per cent., payable October 1st.

Quicksilver Mining Company, dividend of one and one-half per cent. upon the preferred stock, payable October 1st.

Tamarack Mining Company, dividend of three dollars per share, payable October 7th.

Virginia Mining and Improvement Company, inter-

est due on the trust mortgage six per cent. bonds, payable October 1st at the Boston Safe Deposit and Trust Company, Boston, Mass.

ASSESSMENTS

COMPANY.	No.	When levied.	D th of month in office.	Day of Sale.	Amn't per share.
Alliance, Utah.....	1	Sept. 11	Oct. 15	Nov. 5	.10
American Gulch, Mont.....	1	Aug. 31	Oct. 12	Oct. 30	.02
Apex, Utah.....	1	Sept. 16	Oct. 21	Nov. 11	.05
Balt. & Viet., Utah.....	1	Sept. 5	Oct. 9	Oct. 29	.02
Bellevue-Idaho, Id.....	44	Aug. 17	Sept. 23	Oct. 12	.10
Best & Belcher, Cal.....	1	Sept. 11	Oct. 16	Nov. 6	.25
Bulwer Cons., Cal.....	6	Aug. 6	Sept. 12	Oct. 10	.25
Chicago Mill. & Mfg. Co., Cal.....	2	Sept. 13	Oct. 18	Nov. 4	.15
Cons. New York, Nev.....	1	Aug. 14	Sept. 18	Oct. 9	.25½
Crown Point, Cal.....	52	Sept. 18	Oct. 21	Nov. 11	.50
Del Norte, Cal.....	2	Aug. 24	Oct. 3	Oct. 26	.07½
Double Standard, Dak.....	3	Aug. 29	Oct. 2	Oct. 18	.00½
East Sierra Nevada, Nev.....	1	Aug. 8	Sept. 13	Oct. 7	.16
Florence, Dak.....	4	Sept. 21	Oct. 21	Nov. 5	.002½
Gray Eagle, Cal.....	14	Aug. 13	Sept. 16	Oct. 8	.04
Grey Eagle, Dak.....	2	Sept. 10	Nov. 9	Nov. 30	.005
Hartley Cons., Cal.....	1	Sept. 17	Oct. 19	Nov. 5	.05
Keyes, Nev.....	4	Aug. 27	Oct. 1	Oct. 21	.30
Livermore, Cal.....	1	Sept. 18	Oct. 19	Nov. 6	.50
New La Plata, Dak.....	3	Sept. 19	Oct. 21	Nov. 5	.001
North Belle Isle.....	16	Sept. 18	Oct. 22	Nov. 13	.20
North Carolina, Cal.....	13	Aug. 6	Sept. 23	Oct. 8	.10
Peer, Ariz.....	8	Sept. 4	Oct. 10	Nov. 5	.10
Potosi, Cal.....	33	Sept. 18	Oct. 22	Nov. 12	.50
Scorpion, Nev.....	1	Aug. 8	Sept. 13	Oct. 7	.10
Scott Bar, Cal.....	3	Sept. 10	Oct. 12	Oct. 31	.10
Union, Utah.....	1	Sept. 6	Oct. 10	Oct. 30	.00½
W. Y. O. D., Cal.....	4	Sept. 17	Oct. 19	Nov. 4	.20

* Delinquency and day of sale postponed to dates given above.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 308 and 309.]

New York.

FRIDAY EVENING, Oct. 4.

There has been little, if any, improvement in the mining share market this week. The "specialties," so called in some cases because they are specially worthless and in others because they are specially speculative, are not attracting much attention. The Comstocks move slowly, and the few shares, not inappropriately termed investment securities, have met with only a very moderate demand.

Phoenix, of Arizona, did not show much life till yesterday, when liberal buying on both exchanges advanced the price from 49@50c. to 59@61c. To-day, the inquiry ceased and prices weakened. Closing quotations are 55c. Sales for the week aggregate 1,100 shares. It is stated work will actively begin at the mine very shortly. The stockholders' meeting will be held next Thursday afternoon. It is to be hoped that by the honest development of the property the managers of the enterprise will show that none of the methods of the former promoters of the company are to be retained.

The Comstocks are dull. The San Francisco market, temporarily, seems to be without a leader.

During the week Consolidated California & Virginia sold at \$6.25@7.88; Crown Point, \$2.75; Belcher, \$2.70; Ophir, \$4.70@4.55; Savage, \$2.05; Yellow Jacket, \$3; Andes, \$5c.; Bullion, 70@80c.; Exchange, 55c.; Julia, 40c.; Occidental, \$1.40@1.50; Oriental & Miller, 5c.; Potosi, \$1.50; Scorpion, 85c.; Utah, \$1.10; Alta, \$2.30, and Mexican, \$3.80.

The old Sutro Tunnel stock sold at 5c., and the new Trust Certificates at 60@64c.

As noted last week, some of the Exchange members are inclined to regard the new Sutro Tunnel securities rather distrustfully. There seems to be a feeling that the re-organization committee is going to make altogether too good a thing out of the reorganization, and that the interests of the stockholders have not been properly taken care of. We have not been able, however, to learn of any definite charges against the present management. The question has been asked, "What has been done with the royalties paid by the various mining companies using the tunnel during the period of reorganization, from the date of the Sheriff's sale of the property, January 14th, 1889, to the date of the incorporation of the new company, August 30th, 1889?" Mr. H. H. Thayer, the assistant secretary of the old Sutro Tunnel company, to whom the question was propounded yesterday, said that all receipts have been held in trust by the Reorganization Committee, who will render a full accounting for the same to the stockholders of the new company.

The Tuscarora shares are apparently uninviting to both speculators and investors.

There has been rather more activity in the shares of the Bodie mines, but no news of importance from the camp has been received. Bodie Consolidated sold at 70c., and Standard Consolidated at 95c. It has been suggested that a consolidation of the Bulwer and Standard companies would be advisable and beneficial to all interested. With the management of the Bulwer Company in its present hands, we do not believe there is much probability of such action.

The Amador county shares have improved somewhat; Astoria is steady at 20c. A San Francisco paper has some very uncomplimentary things to say about the Amador mine and its superintendent, Mr. A. P. Minear.

Brunswick has fluctuated from 5c. to 3c. Some of the holders of these shares who bought them at high figures feel that they have been badly bitten.

Plymouth Consolidated is stronger. Sales are reported at \$5 and at \$3. It will be remembered that the president of the company has returned to town. What is the true explanation of the fluctuations of this stock?

Quicksilver Common, sold at \$6.13@6.38.

The Dakota stocks have attracted more attention than usual. Hcme stake is off at \$9.50. Deadwood-Terra is fairly steady at \$1.50. Interesting information concerning the work at this mine is given in our mining news columns. Caledonia developed the biggest surprise of the week. For a long time past there have been bids in the market at \$3, but these were suddenly withdrawn this week, and yesterday an offer of 100 shares finding no buyers at the last quotations, was closed at \$2.75. To-day a well-known broker, with the sacrifice of only 300 shares, broke the price to \$2.25 and \$2.10 successively, a full decline of one dollar per share. It is said, we know not with how much truth, that this effort to bear the stock originates with insiders, and that a stock which has always been respectable is at last to be subjected to a deal. Vague rumors that next month's dividend may be passed, are heard. The statement in our last issue that the company has a cash surplus approximating \$40,000, was made on the authority of Messrs. Laidlaw & Co., the transfer agent in this city. Iron Hill sold at 48c. According to the Dakota papers, the new smelting process recently tried by this company has been fairly successful, and Seth Bullock, the president, is making arrangements for the disposal of the company's product in the future.

Horn Silver is quiet at \$1.35. President Washington is expected back from the Salt Lake stockholders' meeting next week. Ontario sold at \$35.25. Messrs. Lounsbury & Co. inform us that the Daly Mining Company had a balance on July 1st of \$431,850.90.

The chief features of the business in Colorado shares has been the firmness of Little Chief and the weakness of Ward Consolidated. Little Chief sold at 36@39c., the latter being the highest quotation reached in some time. A full report of the stockholders' meeting will be found in our mining news columns. Ward Consolidated has declined from \$1.20@1.10. This decline is said to be only for the purpose of protecting a sort of interest held by insiders. The officers of any company who short the stock of an enterprise which they control, deserve condemnation. It will be well for traders to consider what our Leadville correspondent has to say about Ward Cons. in another column. Small Hopes sold at \$1.05, Leadville at 9c., Plutus at 71@72c., Cashier at 3c., Adams at 28c., Silver Cord at 71@70c. and Chrysolite at 25c.

We are inclined to believe that the sales of Colebis of New Mexico at \$9.75@10 are simply washed transactions for the purpose of creating a market value for the stock, which, we understand, is being sold by subscription in Boston at \$10. The last quotations previous to these high figures were made during the summer at \$6. Last spring the stock was offered here at par, \$5 per share, but it didn't "go" very well and the shares were taken to Boston. The secretary of the company informs us that Messrs. R. H. Whitney & Co., of Boston, now have it in charge, and that, as above noted, \$10 per share is the offering price. The company is capitalized at \$500,000, there being 100,000 shares. At the present quotation, therefore, the stock is selling at 100 per cent. above par, and a valuation of \$1,000,000 is placed upon the property. We are informed that the principal work now being done is the erection of a mill which at first will have 10 stamps.

Shoshone sold at 2@3c., and it seems to be questionable if it is really worth this figure.

Rappahannock is quiet at 6c.

Those shares of two properties at the extreme ends of the country—Mutual Mining and Smelting, of Washington, and United Copper, of Maine—sold at \$1.45@1.50 and at \$1.10@1.25, respectively.

El Cristo hovers around a dollar, and no news from the mine is forthcoming.

Silver Mining of Lake Valley sold at 30c.

A choice assortment of reminiscences is furnished by the following list of companies organized some years ago for the alleged purpose of mining, which the Committee on Mining Securities of the Exchange wants to know something about. Bradshaw, Eastern Oregon, Gold Stripe, North Standard, New Germany, Oriental & Miller, Phoenix G. & S., Stanislaus, Surinam, Stormont, Castle Creek, Holyoke and Monitor.

We are able this week to throw a little light on the affairs of the El Talento Mining Company, of the Republic of Colombia, concerning which we printed in this column last week an interview with a perplexed shareholder. So far as can be learned, the information then published was entirely correct. The enterprise has a capital of \$500,000 in \$2 shares.

Mr. E. E. Olcott, whose mission to examine the property we referred to, was also to act as superintendent. Mr. Olcott's report was evidently not favorable, and on his return he resigned his superintendency, and the

board of directors resigned in a body. No official report was made to the stockholders, because he was sent by some interested parties to examine the mine, and not by the company. On June 3d, 1888, the following board was then chosen: Henry Cummins, C. C. Alden, Willis A. Barnes, Wm. T. Black, and John M. Carter. Mr. Cummins was subsequently elected president, and Mr. Alden secretary and treasurer.

The stock was non-assessable, and the company being organized under New York State laws, there were no means of raising more money, and the parties owning a majority of the Talento stock organized the Tolima Mining Company, with a capitalization of \$500,000, divided into dollar shares. The new company was to acquire property contiguous to that of the El Talento, and on the payment of five cents a share and the surrender of their certificates the stockholders of El Talento could become owners of Tolima shares.

They were allowed this privilege for one year, beginning June, 1888. It is said that most of the El Talento stockholders availed themselves of this offer and transferred their shares for those of the Tolima Company. The El Talento Company, however, remained intact; its property, we are told, was not encroached upon and its shares were in no way made invalid. Work upon its property was simply suspended and has not been resumed since.

The Tolima Company began actual work in November, 1888, and, we are informed, has continued operations steadily to date. The situation at present, therefore, is that the Tolima Company, upon whose property work is actually being done, controls a working majority of the stock of the El Talento Mining Company; that according to the officers of the latter company there appears to be little likelihood of any work being resumed; that the period during which El Talento stock might be exchanged for Tolima certificates has expired, and finally that Talento shares are worth little or nothing.

Boston.

Oct. 3.

[From our Special Correspondent.]

There is but little doing in mining stocks, and prices continue to decline in sympathy with the regular stock market, and there seems to be no immediate prospect of improvement.

Calumet and Hecla declined on very light transactions from \$2.15 to \$2.11, notwithstanding the fact that the output last week was 739 tons against 682 tons the week previous, equal to nearly 40,000 tons per annum.

Boston & Montana is the most active stock on the list, and shows a decline from \$35 to \$33½, with more stock offering than usual.

Tamarack is steady on very small sales at \$105.

Quincy firm at \$50.

Oseolia declined from \$10 to \$9½.

Franklin advanced from \$8¾ to \$9.

Kearsarge sold at \$4½, same as last sale.

Atlantic sold at \$7½.

Pewabic advanced from \$2¼ to \$3, and seems to be wanted at this price.

Santa Fe has further declined from 50c. to 42½c., and is very heavy.

Bonanza sold at 62½c.

In silver stocks, Dunkin advanced from 75c. to 87½c., dividend on, and sold to-day at 80c., ex dividend. Napa Quicksilver steady at \$3¼@4. A sale of 1,000 shares of Catalpa at 9c., and 1,000 Crescent at 3c., is reported.

Market closed dull and inactive.

Denver.

We have received the following letter, and herewith refer it to our esteemed contemporary for reply:

NEW YORK, September 28th.

EDITOR ENGINEERING AND MINING JOURNAL—SIR: I notice that you publish among your mining share quotations a table of the transactions of the Denver Mining Exchange, furnished by the Denver Mining Industry. Will you kindly permit me to ask the *Industry*, through the columns of your valuable JOURNAL, (1) whether or not these sales are bona fide transactions? (2) to what extent do they represent a purely commission business? and (3) what is the form of application for "listing," and what steps are taken to ascertain the value of properties making such application and to prevent the listing of "wild cats," such as have brought the New York mining stock business to such a disgraceful condition?

A NEW YORK INVESTOR.

A correspondent sends us the following from Colorado in reference to the "Modest Denver Mining Exchange":

"The management of the Exchange has cut off Eastern mining stock and petroleum quotations, and has been wise in doing so. The Mining Exchange of America is right here in Denver, and don't you forget it. Let St. Louis and New York rustle for our quotations, but we can get along without theirs."

The above, taken from the *Denver Mining Industry* of Sept. 13th, must be taken in a spirit of bravado. New York, St. Louis, Philadelphia and Boston mining exchanges will continue to transact business regardless of Denver. The following statements regarding the merits of the properties listed may be of interest:

The May Mazepa has never paid dividends, some \$80,000 in debt. White Pine, Gunnison County. Mr. C. E. Taylor, stock broker, is largely interested in the mine, and is also the manager. The mine is under lease to Dr. P. E. Huges and Burt Ledyar, who claim three to four feet of low grade concentrating ore, which other practical millmen failed to make pay.

The Brownlow, Mosquito District, three miles west

of Alma, Park County. The Brownlow was originally known as the Nesto Mining Company, capital stock, \$300,000; number of shares, 150,000; par value, \$2 per share. The company failed to make expenses, the property was mortgaged for \$40,000 and bonds issued; the mortgage was foreclosed, the property reverted to the bondholders, who reorganized the Brownlow Mining and Milling Company. Ninety days ago the property was \$8,000 in debt. Since that time enough treasury stock has been sold to clear the indebtedness and leave a small working fund. As a matter of fact, the property never paid expenses in the past, and is not likely to pay heavily in the future, at a capitalization of \$1,000,000. The Tourtelotte Park Mining Company, Pitkin County, organized at St. Louis, Missouri, have been operating on lease and bond east of the Silver Belle, in the quartzite, shifted hostilities to Buckhorn mine, meeting with indifferent success. A "wild cat" scheme of uncertain promise and future, The Calliope, Matchless and Mollie Gibson are properties of merit, having declared dividends on a fair capital. Generally the mines are capitalized or stocked too high at the Denver Mining Exchange, the range of profit per share too small. Considerable swapping of jack-knives and mining shares is indulged in by the "bulls and bears."

Unquestionably the Denver Exchange, well managed, can prove a great benefit to mining, but unfortunately it may also be made a positive injury to it if allowed to degenerate into a foster mother for wild cats, and we trust that our esteemed contemporary, the *Mining Industry*, from which we expect much, will close its columns to puffing or promoting such concerns as the Brownlow, the Claudia J., Morning Claim and others. We would also add that reports by interested experts are no proper basis for listing stocks.

San Francisco.

During an unusually dull week the brokers' commissions on all mining stocks sold in the morning sessions of San Francisco boards on September 24th did not exceed \$40, about \$1 for each broker if equally divided. The lightest transactions in a morning session of the boards on record, according to the *San Francisco Report*, aggregated 350 shares on January 15th, 1886. The brokers' commissions on that session's sales were about \$5. On December 2d, 1886, the sales in the two morning sessions of the San Francisco stock board footed up a total of \$676,793.

Trust Stocks.

It is announced in Baltimore that the Maryland White Lead Company has been absorbed by the National Lead Trust.

Electric Stocks.

The annual report of the Consolidated Electric Light Company for the last year, submitted to stockholders' meeting September 18th, shows: Capital stock outstanding, \$2,404,400. Debenture bonds outstanding, October 1st, 1888, \$325,000.

The company, in addition to paying quarterly dividends at the rate of 4 per cent. per annum and \$25,373.81 for expenses, including interest on debenture bonds, increased its sinking fund from \$58,400 to \$90,624. This company receives from the Westinghouse Electric Company, for the lease of its New York and Pittsburgh property, \$150,000 per annum, being 6 per cent. upon its capital stock and one cent royalty upon each incandescent lamp manufactured by the lessees or its associates. The income would warrant an increase of dividend rate above 4 per cent. per annum, but it was decided that the interest of the stockholders would be enhanced by a further increase of the sinking fund for the anticipation of the payment of the debenture bonds of the company.

PIPE LINE CERTIFICATES.

(Special Report by Messrs. WATSON & GIBSON.)

The field report for the last month shows a decrease of new production in petroleum of about 1,000 barrels daily, otherwise the situation remains about as it was the month before. The price of refined oil has been reduced fractionally this week, but no news has come into the market to influence this change. It was doubtless made on account of the slack demand for kerosene.

The speculative market has been at a stand-still, and while bulls are wondering why it does not go up, bears are wondering why it does not go down. Brokers wish that it would do one or the other, but the Standard Company appears to wish that it should do neither. Ergo, it is dull and stationary.

NEW YORK STOCK EXCHANGE.					Sales
Opening.	Highest.	Lowest.	Closing.		
Sept. 28.....	98 1/4	99 1/4	98 1/4	99	68,000
30.....	98 3/4	99 3/4	98 3/4	98 3/4	99,000
Oct. 1.....	98 3/4	99 3/4	98 3/4	98 3/4	137,000
2.....	99	99	98 3/4	98 3/4	94,000
3.....	98 3/4	99	98 3/4	98 3/4	153,000
4.....	98 3/4	99	98 3/4	98 3/4	73,000
Total sales in barrels.....					624,000
CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.					Sales.
Opening.	Highest.	Lowest.	Closing.		
Sept. 28.....	98 1/4	99 1/4	98 1/4	99 1/4	73,000
30.....	98 3/4	99 3/4	98 3/4	98 3/4	223,000
Oct. 1.....	98 3/4	99 3/4	98 3/4	98 3/4	347,000
2.....	99 1/4	99 1/4	99	99	185,000
3.....	99 1/4	99 1/4	98 1/4	98 1/4	428,000
4.....	98 3/4	99	98 3/4	99	162,000
Total sales in barrels.....					1,423,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 4.

Statistics.

PRODUCTION OF ANTHRACITE COAL for week ended September 28th and year from January 1st.

Tons of 2,240 lbs.	1889.		1888.	
	Week.	Year.	Week.	Year.
P. & Read. R.R. Co.....	184,260	5,170,828	4,951,108	
Cent. R.R. of N. J.....	122,886	4,330,118	4,122,657	
L. V. R.R. Co.....	210,603	5,491,358	4,902,892	
D. & H. W. R.R. Co.....	114,725	3,769,965	4,917,855	
D. & H. Canal Co.....	73,383	2,817,401	3,301,742	
Penna. R.R.....	63,154	2,382,106	3,335,792	
Penna. Coal Co.....	24,951	956,428	1,243,364	
N. Y., L. E. & W.....	15,250	815,878	640,087	
Total.....	809,212	25,731,082	27,445,497	
Decrease.....			1,711,415	

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.

These figures are subject to corrections for duplications.

Production for corresponding period:

1884.....	22,454,826	1886.....	22,683,348
1885.....	22,042,884	1887.....	25,118,852

PRODUCTION OF BITUMINOUS COAL for week ended September 28th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2,240 lbs.	1889.		1888.	
	Week.	Year.	Week.	Year.
Phila. & Erie R.R.....	3,613	55,842	47,053	
Cumberland, Md.....	58,577	2,260,458	2,653,116	
Barclay, Pa.....	2,950	84,398	118,480	
Broad Top, Pa.....	7,167	240,082	258,522	
Clearfield, Pa.....	63,606	2,288,971	2,495,427	
Allegheny, Pa.....	17,467	586,550	577,531	
Beach Creek, Pa.....	33,881	1,111,377	1,119,661	
Pocahontas Flat Top.....	34,993	1,258,595	1,079,693	
Kanawha, W. Va.....	38,725	1,342,280	1,178,858	
Total.....	261,009	9,228,553	9,478,341	

WESTERN SHIPMENTS.

Pittsburg, Pa.....	13,513	467,392	527,847
Westmoreland, Pa.....	39,802	1,084,514	1,135,477
Monongahela, Pa.....	6,964	296,440	301,445
Total.....	60,279	1,848,346	1,964,766

Grand total..... 321,288 11,076,899 11,443,107

PRODUCTION OF COKE on line of Pennsylvania R. R. for week ending September 28th, and year from January 1st, in tons of 2,000 lbs.: Week, 93,461 tons; year, 3,203,877 tons; to corresponding date in 1888, 2,919,554.

Anthracite.

The coal trade has improved somewhat during the past few days, and is fairly active though the demand is not nearly equal to what some time ago was expected that October would bring us. Prices remain about as heretofore, that is at the March or sometimes the May circular rates, though within a few days better prices have been obtained on some sizes. Stove coal is in best demand, and some of the companies are "sold up," and pea coal is also in good demand.

The various rumors and statements concerning the combination of all the anthracite interests in a great "Trust" has only a very thin foundation of fact. No doubt much "talk" has been indulged in by some of the interested parties and by these seeking to boom the stock market, but there is no prospect of any effective trust being formed.

The stock market has been worked up while the coal market was in the dumps. If the companies had restricted production early in the season they would have been able to maintain prices at circular figures, and would have had a better foundation for advancing the stock market, and would, at the same time, have strengthened the somewhat waning faith of the public in the ability of the companies to maintain prices. That faith well nigh disappeared when the companies advanced prices on paper and continued to sell at about the opening prices of the year. It will be difficult to re-establish confidence another year.

From this time out we should have a pretty active market, which should absorb the 3,000,000 tons which is the allotment for October. The retail trade is beginning to feel the effect of the cold weather.

Bituminous.

This market has not changed since our last report. In the early part of the week vessels were more plenty, but they are now scarce, and particularly to Eastern ports. Cars along the line and to the seaboard are still in demand, and the amount of coal that can be brought forward is consequently rather restricted. Prices are firmer at last week's quotations, but not quotably changed. We may quote \$2@2.60 f.o.b. Philadelphia and Baltimore; \$3.25 f.o.b. New York, and \$3.50 alongside at this port. The statistics of production show no important change in the situation. The amount of coal shipped east and north to September 21st aggregated 8,967,544 tons, as compared with 9,334,260 tons to corresponding date last year. The shipments from the Pocahontas and the Kanawha regions continue to show an increase and the Cumberland district is some 370,000 tons behind its record of 1888.

According to a dispatch from Charleston, W. Va., articles incorporating a large coal mining company were issued by the Secretary of State on the 3d inst. Among the incorporators are Vice-President Morton, Abram S. Hewitt and Mr. Bliss, the New York banker. W. N. Page, of Ansted, Fayette County, W. Va., will be general manager. The corporators have leased the

property of the Hawk Nest Coal Company, in Fayette County, on the line of the Chesapeake & Ohio Railroad, and will at once construct a broad gauge railroad to take the place of a narrow gauge line now in use, connecting the mines with the Chesapeake & Ohio, the distance being four and one-half miles. The mines will have a capacity of 500 to 1,000 tons daily.

Boston.

Oct. 4.

[From our Special Correspondent.]

The coal trade at this port is improving and the volume of business already shows some increase over that of September. The retailers have begun to put out coal to consumers quite rapidly now. Individual operators are not pressing any large amount of coal for sale and the companies are holding more nearly to circular rates than for many weeks. It seems hardly reasonable to say it, but there seems to be something of a scarcity of stove coal just at present and \$4.15 f.o.b. at New York is asked, where \$4.00 ruled a few days since. There is no doubt coal enough, but the business of the week has reduced the immediately available supply of domestic sizes materially. The Philadelphia & Reading people are particularly short of coal, and the Lehigh Company has sold well up to its delivering capacity. Continued cool weather like that of a week past will put the market in excellent shape, according to the unanimous sentiment of the local jobbers.

The bituminous trade is very fair. Prices are quite well maintained. Good steam coal does not go begging this year. Cumberland coal shippers are restive at the poor service of the B. & O. R.R., but can, apparently, do nothing to help matters. Some bituminous shippers have bought lots of coals from shippers not tied up with large contracts this year, and are likely to buy still more. The f.o.b. prices remain at \$2.50@2.60.

The freight situation is improved, from the vessel owner's standpoint.

The big fleet which left here over two weeks ago did not change the aspect of affairs at shipping ports; in fact, much to the surprise of many, no big fleet appeared at any shipping port, the vessels having apparently scattered in all directions. Freight rates are materially stronger at all ports. At New York \$1 is asked to Boston with 90c. as inside, and at Philadelphia \$1.20@1.25 is quoted. Vessels are very scarce at Baltimore and there is no reliable quotation from there to-day; probably \$1.30@1.35 would be the range for large and small vessels.

The annual meeting of the Coastwise Vessel Owners' Association was held here on Wednesday. The members feel greatly encouraged at their success in the matter of discharging reforms, and propose next to tackle the subject of long tows, which they insist are dangerous, and also to abolish compulsory pilotage fees. They have marked out a big season's work.

Retail trade is beginning to be active and there is talk of an advance, but none is likely to be made right away.

Receipts for the week have been 37,759 tons anthracite and 13,963 tons bituminous, against 47,602 tons anthracite and 27,157 tons bituminous for the same week of 1888. Since January 1st receipts have been 1,189,399 tons anthracite and 687,868 tons bituminous. For October receipts were 202,586 tons anthracite and 97,947 tons bituminous, against 273,928 tons anthracite and 107,180 tons bituminous for October, 1888.

Buffalo.

Oct. 3.

[From our Special Correspondent.]

The demand for anthracite coal is only very moderate for small near-by interior points and for local consumption. Prices unchanged, and nothing said or done indicative of an advance or decline. Stocks ample.

Bituminous coal steady, with good request for manufacturing and steamboat purposes. Supply better and now about adequate for all requirements. Dealers say that business is satisfactory, and those interested in the mines proper seem to be content with the situation of affairs in the mining regions as well as the general condition of trade, for they enter no complaints when spoken to on the subject.

Coke quiet and no quotable change in selling rates.

Coal freights by lake, from this port, continue in a very unsatisfactory condition for vessel owners. Shipments were principally to Chicago and Milwaukee. Lake Superior rates declined 10c. per ton last Tuesday, and many craft could not get that price and left light in consequence. The shipments of coal from September, 26th to October 2d, both days inclusive, aggregated 67,620 net tons, namely: 43,530 to Chicago, 13,050 to Milwaukee, 5,700 to Duluth, 2,010 to Superior, 1,750 to Toledo, 1,300 to Racine and 260 to Dover; total for season to date, 1,607,210 net tons.

The rates of freight were 50c. to Chicago, 45c. to Milwaukee, 30@20c. to Duluth, 25c. to Toledo and Detroit, 60@55c. to Racine and 30c. to Superior.

Receipts, by canal, of coal for fourth week of September, 5,939 net tons; shipments, 431 net tons. Canal charters of coal light in consequence of the difficulty of procuring boats. Engagements: 2 loads to Hion at \$1.05 net ton, free off; 1 load to Syracuse, 75c. net ton, free off, and 3 loads to Syracuse, 75c. gross ton, free off.

Statistical—Railroad receipts and shipments of coal at this port are not reported by request. Receipts of coal by lake thus far this season, none. Shipments by lake, westward, for month of September, 286,290 tons, as compared with 326,010 tons in 1888 and 289,560 tons in 1887; for season to October 1st, 1,584,140 net tons, as compared with 1,833,200 tons in 1888 and 1,382,080 tons in 1887. The receipts of coal by canal for the month of September, 26,568 net

tons, as compared with 30,043 tons in 1888 and 20,706 tons in 1887; the shipments, 1,606 net tons, as compared with 115 tons in 1888 and 1,394 tons in 1887. Total receipts by canal this season to October 1st, 68,498 net tons, as compared with 106,276 tons in 1888 and 46,930 tons in 1887; the shipments, 6,780 net tons, as compared with 6,112 tons in 1888 and 6,702 tons in 1887. The aggregate shipments by lake this year to date show a decrease of 249,060 net tons, as compared with those of 1888. The rates of freight by lake hence to points named were as follows. During the month of September, 60@50c. to Chicago, 50@45c. to Milwaukee, 40@30c. to Duluth and Lake Superior ports.

The rate to Chicago, September 30th, 1889, was 50c.; in 1888, 80c.; and in 1887 \$1.25 per net ton. The shipments of coal by lake this season to October 1st were distributed about as follows:

To	Tons.	Mackinaw	Tons.
To Chicago	679,100	Mackinaw	650
Milwaukee	339,290	Houghton	2,850
Duluth	86,140	St. Ignace	500
Superior	71,640	Port Burwell	35
Racine	25,510	Kelly Island	690
Detroit	24,360	Port Clinton	740
Bay City	5,370	Muskegon	1,530
Alpena	600	Hancock	2,000
Windsor	2,750	Owen Sound	500
Sheboygan	6,810	Perry Sound	50
Saginaw	11,280	Depere	1,100
Green Bay	23,000	Toledo	27,020
Washburn	800	Port Rowan	70
Escanaba	1,550	Cheboygan	700
Amherstburg	690	Marquette	11,960
Oscoda	600	Port Stanley	85
Dover	355	Menominee	1,150
Chippewa	43	Algona	310
Pequaming	50	Lake Linden	4,375
Kenosha	8,220	Manitowoc	6,130
Port Huron	3,350	Marine City	430
Port Arthur	3,220	Duncan City	50
Sandusky	350	Foreage	2,450
Port William	1,800	Ludington	530
Gladstone	26,280	Various ports by ves-	
Au Sable	450	sels clearing from	
Huron, O.	240	Tonawanda receiv-	
Victoria Harbor	200	their cargoes here	
Wallaceburg	350	but not included in	
Sault Ste. Marie	2,000	reports of Custom	
Serpent River	40	House	201,868
Ashland	19,780		

Pittsburg. Oct. 3.

[From our Special Correspondent.]

Coal.—We can report a fair market, with an increased demand; although no advance has yet taken place the tendency is that way. There will be a larger demand this winter than last. The gas companies want the earth and all therein. Many works and private dwellings are going back to coal. The coal syndicate not yet reported. Joseph Walton & Co. started one of his works this morning.

The nominal rates are:

PRICE OF COAL PER 100 BUSHELS = 7,600 LBS.

First pool	\$4.75	Fourth pool	\$3.25
Second pool	4.50	Railroad coal	5.00@6.00
Third pool	3.90		

Connellsville Coke market. firm; demand active and cars scarce. Schoonmaker & Co. are 590 cars short; others are no better off, as noted in my last, obtained from officers in this city. Furnace, f.o.b. at works, \$1.50; dealers, \$1.65; foundry, \$1.80, with a prospect of higher prices in the near future. McClun & Co. and H. C. Frick & Co. are still purchasing coke plants and coal lands. H. C. Frick & Co. shipped 1,100 cars in a single day—600 being for points west of Pittsburg.

FREIGHTS.

From Baltimore to: Bath, Me., 1.20@1.25; Boston, Mass., 1.20; Bridgeport, 1.10; Brooklyn, 1.00; Charleston, 75@85; Fall River, 1.10; Galveston, 3.00; New Bedford, 1.10; New Haven, 1.10; New London, 1.10; New York, N. Y., 1.00; Portland, 1.20; Portsmouth, 1.25; Providence, 1.10; Richmond, Va., .70; Salem, Mass., 1.20; Somerset, 1.10; Williamsburgh, N. Y., 1.00.

From Philadelphia to: Alexandria, .85; Boston, Mass., 1.10@1.15; Charleston, .80; Fall River, .80@.90; Galveston, 3.50; Georgetown, D. C., .85; Lynn, 1.25@1.35; New Bedford, .80@.90; New York, .90; Norfolk, Va., .80; Portland, 1.15; Providence, .80@.90; Richmond, .90; Salem, 1.30; Washington, .85; Savannah, 1.15.

From New York to: Bath, Me., .90; Boston, Mass., .75; Charlestown, .75; East Boston, .75; Lynn, 1.00; New Haven, .60; Portland, .75; Portsmouth, N.H., .85; Quincy Point, .75; Salem, Mass., .75; Sanguis, .80.

* And discharging. † Alongside. ‡ And towage.

METAL MARKET.

NEW YORK, Friday Evening, October 4.

Prices of silver per ounce troy.

Sept	Sterling Exch'ge	Lond'n Pence	N. Y. Cts.	Oct.	Sterling Exch'ge	Lond'n Pence	N. Y. Cts.
28	4.87½	42½	93	2	4.87	42½	93
30	4.87½	42½	93	3	4.86¾	42 11-16	93½
Oct. 1	4.87	42½	93	4	4.86½	42 11-16	93

Council bills declined 3/4d. on Wednesday's allotment. Silver has continued steady and in good demand for London shipment; but tight money and lower exchange has affected the New York price.

United States Assay Office at New York reports total receipts of silver for the week 125,000 ounces.

Yesterday's purchase of silver bullion at the Treasury, Washington, aggregating 416,000 ounces, or about one-fifth of the total supply for the month, was induced by the low prices at which it was offered. Owing to the small average of recent purchases, the stock on the dealers' hands had accumulated and the offerings were extraordinary in size, as well as price.

The large sum of £1,000,000 in treasure was recently brought to San Francisco from Australia by the steamship Zealandia. This coin was consigned to the banks in the city to be disposed of to the United States Mint at its real value. Shipments of similar large amounts will be made for several months. The reason of these shipments is that Australian bankers find it cheaper to handle the exchange on London and other European cities via San Francisco, than direct to London. It is probable that most of the money is for the purchase of wheat. The new colonial sovereigns are thrown into the melting pot, and come out as American gold.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting made no change in its minimum rate for discount, and it remains at 5 per cent. During the week the bank lost £914,000 sterling bullion, and the proportion of its reserves to its liabilities was reduced from 42 1/2 to 33 3/10 per cent., against a decrease from 41 1/2 to 33 7/8 per cent. in the same week of last year, when its rate of discount was 5 per cent. Thursday the bank lost £55,000 bullion on balance. The weekly statement of the Bank of France shows a decrease of 2,175 francs gold and 375,000 francs silver.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars	\$.73	\$.74
Mexican dollars	.74	.74½
Peruvian soles and Chilean pesos	.72	.73½
English silver	4.85	4.90
Five francs	.94	.95
Victoria sovereigns	4.85	4.89
Twenty francs	3.88	3.93
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.75
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.65
100 guilders	3.96	4.00

Copper.—From the reports received from all quarters it is evident that the demand for copper for domestic consumption is at the present time exceedingly heavy. We also hear on good authority that there are scarcely any stocks of copper at the lakes, and that orders have lately been coming so rapidly that the lake companies are practically sold out up to the end of November. The foreign bankers who hold stocks in warehouse have now altogether withdrawn from the market and decline to quote at any price. The quotations in this market are unaltered at 11c. for Lake, 10 1/2c. for Arizona, and 10c. for casting brands.

The European markets have experienced moderate fluctuations during the week; and in London Chili bars and S. M. B.'s declined on Wednesday to as low as £42 10s. @ £42 12s. 6d. for spot and £41 10s. @ £41 12s. 6d. for three months; but to-day (Friday) a stronger tone is again reported, and the latest closing quotations are £43 @ £43 2s. 6d., spot, and £42 @ £42 2s. 6d. three months.

Refined sorts show no alteration from last week's quotations.

The statistics of visible supplies for the second half of September show a decrease of 100 tons.

An item of interest in connection with the collapse of the notorious French Copper Syndicate is that during the past week the Commercial Tribunal of the Seine has imposed heavy fines on the directors of the old Comptoir d'Escompte, for their action regarding the operations of the Société des Metaux. This matter is referred to on our editorial pages.

In our review of the copper trade in the ENGINEERING AND MINING JOURNAL of September 7th we made the following reference to the break in the copper market, which was caused by a banking house here—known as the representatives of the Rothschilds—having sold a certain amount of copper at 11 1/2 cents when the market was 12 cents.

"It is surprising that the great house of Rothschilds, which is so heavily interested in the debris of the old syndicate, and which might be supposed to be above such a small transaction, should have deliberately broken the market while the compact was under discussion and the several producers were honestly maintaining prices at the standard of 12 cents agreed upon, but it has done it and has done it in vain, for if it expected to be able to sell much of its copper at 11 1/2 cents it will promptly be undeceived."

Messrs. August Belmont & Co. have shown us a cablegram received from Messrs. Rothchild containing a request to us to rectify this statement. They say the copper sold here, to which we had made reference, was sold on account of the Bank of France, and not at all on account of the Rothschilds, who have not sold any.

It gives us great pleasure to make this correction. The error on our part, or rather on that of our informants, was not unnatural, since the house which sold the copper was recognized rather as the representative of the Rothschilds than as the agents of the Bank of France. It was certainly a matter of great surprise to us that the great house referred to should have taken such action, and we are very pleased to place upon record their prompt and entirely satisfactory denial of the report.

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

To	Copper Matte.	Lbs.	\$8,000
To Liverpool—			
By S. S. Nevada	98 casks	100,000	126
" Umbria	1 cask	1,250	126
" Spain	6,271 sacks	692,160	30,900
To Liverpool—			
By S. S. The Queen	500 pigs	155,884	15,575
" City of Berlin	379 pigs	113,772	11,500
" Alaska	531 pigs	191,262	19,015
To Havre—			
By S. S. LaGascogne	90 casks	112,500	13,500
" "	188 pigs	56,162	5,625
To Rotterdam—			
By S. S. Obdam	99 pigs	41,476	3,600
" "	18 casks	22,500	2,700
" "	204 casks	33,604	4,030
" "	241 pigs	70,704	7,070
" "	135 casks	163,750	18,500

Tin.—The scarcity of spot and near futures continues, and consumptive demand is very brisk. Under these circumstances buyers willingly pay higher prices for prompt and early deliveries than for more deferred shipments. Arrivals from abroad are coming to hand at a fair rate, but, as far as can be judged, nearly all the metal arriving goes directly to consumers, and it is therefore not at all improbable that the existing condition of the market, with spot and near by futures at a considerable premium over quotations for late deliveries, will continue over the whole of the present month, and very likely during part of November. Our home market has lately moved more independently than usual of the London quotations, in which market prices gave way during the week until as low as £88 1/2s. to £88 17s. 6d. spot, and £89 7s. 6d. to £89 10s. futures was touched. Today, however, the London market is decidedly firmer again, and the closing quotations received by cable are: Spot, £89 2s. 6d. to £89 5s.; three months' futures, £89 15s. to £90.

The statistics of visible supplies of tin for the month of September show a decrease of 300 tons. Our closing quotations are: Spot, 20'60; October, 20'40; November, 20'15; December, 20'10.

Lead.—The lead market has been comparatively neglected, but some sales were effected early in the week as low as 3 5/8. Yesterday 3 9/8 was paid, however, and higher prices are now asked. The offerings are very light, and no pressure to sell can be noticed in any quarter. Our closing quotations to-day are spot and October, 3'95, and November and December, 4c. The London market is firm at £12 10s. for Spanish and £12 15s. for English.

The Chicago Market.—Messrs. Everett & Post telegraph us to-day as follows: Our market has been firmer during the past week, values advancing to 3'80c. Sales have not been large, as consumers are well supplied with near-by lead, and find it impossible to buy futures at current quotations. The present situation is such that no great change in prices is likely to occur unless influenced by fluctuations in the New York market.

The St. Louis Market.—Messrs. John Wahl & Co., telegraph us as follows to-day: Under a light business, the market has remained practically unchanged. Prices nominally 3'70c., 3'72 1/2c. and 3'75c. for common, refined, and chemical.

Spelter.—The Western markets are very steady, and nothing can be bought there below the parity of 5'20 to 5'25 New York. The Eastern markets are, however, rather overstocked for the moment, and we have, therefore, to reduce the New York quotations to 5'10 — 5'5. The surplus quantity at present hanging over the Eastern market is, however, not large, and as soon as it is cleared out of the way, the disparity in prices will certainly disappear. In Europe the demand for consumption is again reported as very brisk, and after a slight lull prices are stronger again, the closing quotations being £21 10s. for ordinaries and £22 for special.

Antimony.—In this market no change can be reported. We quote Cookson's 19@19 1/4, and Hallett's 17 1/2@17 1/4. Cables from England report that market firmer.

Nickel.—The available supply is slightly large, and asking prices are lower. We get quotations of 80c. but it is said in some quarters that much lower figures may be accepted. The limited market for the article and the comparatively few dealers in it make the price subject to the most arbitrary changes.

Quicksilver.—The London market under freer offerings broke this week to £9, but cables received to-day indicate that most of the holdings which occasioned the weakness have now been closed out, and an early recovery is looked for. The New York quotations have not been much affected, being at wholesale \$48 flask, and in small lots at 65c. per pound.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, October 4.

Pig Iron.—The market continues quiet, with moderate transactions. As a rule, buyers are not urgently in need of iron, and the furnaces, on the other hand, continue to be well sold up for prompt delivery. We note sales of 5,000 tons of Northern iron and 2,000 Southern. It is noticeable that there is less difference than there has been for some time between the prices of the Northern and the Southern brands. Very good grades of Northern iron can be purchased at \$17@

\$17.50, and Southern may be quoted at 25c. per ton below these figures. Other quotations in detail are as follows: Northern brands, No. 1 Anthracite Foundry, \$17@17.50; No. 2, \$16@17; Gray Forge, \$15@15.50. Southern brands, No. 1 Coke Foundry, \$16.75@17.25; No. 2 \$15.50@16, and \$15 for Gray Forge.

Transactions in pig-iron warrants on the Stock Exchange have thus far not been a startling success. This has been due chiefly to the fact that there are no warrants offered, and the quotations recorded are consequently purely nominal. It is understood that there are some 6,000 or 8,000 tons of iron in the warrant yards, but none of this appears to be for sale. The promoters of the warrant enterprise, however, say that some of the furnaces have engaged to put various amounts, aggregating 35,000 tons, in yard by the end of the year. With the present equality of the demand to the supply, there is very little inducement for the better-known furnaces to put their iron in yards, and, in fact, very few have the iron to put there. The market closes with limited inquiry and prices generally firm. No immediate advance in quotations is anticipated.

Scotch Pig.—Cables received from Liverpool to-day report a still higher market, and dealings are naturally very much restricted. Warrants have sold in Glasgow for 51s. 2d. Quotations on the leading Scotch brands are as follows: Dalmellington, \$20.50@21; Eglinton, \$20.50@21; Langloan, \$24; Summerlee, \$24.50; Shotts, \$24; Coltness, \$24.50.

Spiegeleisen and Ferro-Manganese.—The advance quoted in this line of material last week continues. Ferro-manganese, 80 per cent., has been sold as high as \$80, 100 tons changing hands at this figure, and other sales at about the same quotation are also reported. At the close as high as \$82.50 to \$85 is asked. So far as can be learned there is not a ton on the spot unsold. It is very difficult to contract for this year's delivery. Spiegeleisen, 30 per cent., is also firm. The average quotations have been \$33, at which figures sales have been made. A large order of American spiegeleisen, 10 to 12 per cent., is now pending, and will probably be closed to-morrow morning, at higher prices than were obtained for 20 per cent. some months ago. It is reported that about 2,000 tons of this grade of American product have been recently sold in eastern Pennsylvania at \$27.

Steel Rails.—This market shows an advancing tendency. At Eastern mills from \$29@30 is quoted, and sales aggregating nearly 40,000 tons are said to have been made during the week at these quotations. Considerable surprise has been occasioned by the announcement that the inside quotation at Pittsburg is now \$35. This quotation was confirmed this afternoon by a representative of Carnegie, Phipps & Co. in this city, the explanation being the increased cost of spiegeleisen and ferro-manganese Bessemer pig and the general improvement in the demand for rails. The inquiry for 10,000 tons for Southern delivery, to which we referred last week, has now been closed by an Eastern mill at \$29@30, and there is also an unconfirmed rumor of the sale of 5,000 tons at \$29 at Scranton, besides light sales to a New England road. Light section rails are firm on the basis of \$30 at works for heavy rails.

Structural Iron and Steel.—Prices in this department are firm. Mills are very busy and the tendency seems to be upward. Locally, contracts have been placed for two new structures, requiring about 1,200 tons of material, viz, the New Jersey Central Railway building and the new structure of the Third Avenue Railway Company. The contract for Andrew Carnegie's music hall, to which we have previously referred, has also been closed, but this has little effect on the market, as Mr. Carnegie's firm will probably furnish the material. Bridge-plate angles and tees are firm, and an advance will probably be made in beams and channels to-day. Steel plates and bar iron are also decidedly firm. Quotations in detail are as follows at mill: Bridge plate, 2 25c.; angles, 2 25c.; tees, 2 5@2 6c.; steel angles, 2 35c.; beams and channels, on wharf, 2 8c.

Steel plates are held as follows: Tank and Ship, 2 25@2 6; Shell, 2 8; Flange, 3; Fire-Box, 4. Iron Plates are quoted as follows on wharf: Common tank, 2 25c.; refined, 2 3@2 4c.; shell, 2 4@2 5c.; flange, 3 5@3 7c.; extra flange, 3 3/4@4c.

Bar Iron at mill is quoted at 1 65@1 7c. for common, and 1 75@1 8c. for refined. Deliveries from store are quoted as follows: Common, 1 9c. base; Refined, 2c. base; "Ulster," 3@3 1c. base; "Norway," 5c.; Shapes, and Norway nail rods, 5c.

Merchant steel.—A fair trade with the advanced price noted last week is reported. The market is otherwise without special feature of interest. Prices are as follows: Best English tool steel, 15c. net; American tool steel, 7 1/2@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3 3/4c.; open hearth machinery, 2 3c.; open hearth spring, 2 1/2c.; tire steel, 2 1/2c.

Rail Fastenings.—In this department the inquiry keeps pace with the demand for rails and railway equipments. Prices are firm. For spikes 2 cents is asked, and angle fish-plates are quoted at 1 90c. Bolts and square nuts are quoted at 2 9@3c.; bolts and hex. nuts are quoted at 3c.

Pipes and Tubes.—Business continues at the new schedule of prices, printed in full in this column last week. Rates of discount on wrought-iron pipe remain as follows: Butt welded, plain and tarred, 50 per cent. discount; galvanized, 42 1/2 per cent. discount;

lap-welded, plain and tarred, 32 1/2 per cent. discount; galvanized, 50 per cent. discount. A discount of 57 1/2 per cent. is allowed on boiler tubes of 2 inches and larger, and 52 1/2 per cent. on 1 1/2 inches and smaller. Cast-iron pipe remains at \$25@28, according to size.

Old Material.—The value of old iron rails is now more readily obtained. The sale of from 2,000 to 3,000 tons, New York and Philadelphia delivery, at \$25, to which we referred last week, has now been confirmed; but since then no transactions of importance have been closed. We understand that there are bids in the market for tees at from \$24 to \$24.50, but nothing is offered apparently at less than \$25.25. The latest foreign quotations are 76s. for tees and 79s. for double heads, which is equivalent here to \$25 1/2@26 1/2 respectively.

Old Rails are very scarce, and it is a matter of surprise that with so little difference between the cost of steel rails and the selling price of old iron rails, that railway managers do not take this opportunity to relay their tracks wherever iron rails are now in place. No. 1 wrought scrap iron is quiet at \$21 on board cars at Jersey City.

It will be remembered that at the recent meeting and annual election of the Tennessee Coal, Iron & Railway Company, Mr. John H. Inman and his friends were defeated, and a new management came into power. It is consequently significant that a syndicate of capitalists, of which Mr. Inman is a prominent member, have completed an organization of the Southern Iron Company, which will probably rival, if not eclipse the big enterprise of which Mr. Inman was formerly the head. On Saturday last the Southern Iron Company was organized at Huntsville, Ala., with a capital consisting of \$2,700,000 in stock and \$3,300,000 in bonds. This organization will own four charcoal furnaces in Middle Tennessee, being the consolidation of the La Grange, Etna and the two Warner furnaces of Hickman County, Tenn.; one charcoal furnace at Attala, Ala., one Wayne County furnace and the Roane Iron Company's Steel Rolling Mill in Chattanooga. It is said that two more furnaces will be erected in Wayne County, Tenn. The Roane Iron Company's rolling mill is to be immediately remodeled, and steel products of all kinds will be made by the basic process, using two Siemens Martin furnaces, which will be shortly erected. The directors of the new company will be G. M. Fogg, Nathaniel Baxter, Jr., James Williams, Isaac T. Rhea, Percy Warner, James C. Warner, T. W. Warner, all of Nashville; John H. Inman and Charles M. McGhee, of New York; Thomas Ledden and T. T. Hillman, of Birmingham, Ala., and H. S. Chamberlin, of Chattanooga, Tenn. The officers will be: Nat. Baxter, Jr., president; Wm. McNeely, secretary and treasurer; A. M. Shook, general manager.

Louisville.

Oct. 1.

[From our Special Correspondent.]

There has been no material change in the general situation to report for the past week. A number of sales have been made, aggregating several thousand tons, the larger part being for mill grades, though foundry irons have shared a liberal portion of the orders placed. Sales have been mainly for delivery through the current year, though transactions have been made for more extended shipments.

Hot Blast Foundry Irons.

Southern Coke No. 1.....	\$15.00@15.50.
" " No. 2.....	14.50@ 15.00.
" " No. 3.....	13.75@ 14.25.
Mahoning Valley, Lake ore mixture.....	18.00@ 18.50.
Southern Charcoal No. 1.....	17.00@ 17.50.
" " No. 2.....	16.50@ 16.00.
Missouri " No. 1.....	18.00@ 18.50.
" " No. 2.....	17.50@ 18.00.

Forge Irons.

Neutral Coke No. 1.....	13.50@ 13.75.
Cold Short.....	13.50@ 13.75.
Mottled.....	12.75@ 13.00.

Car Wheel and Malleable Irons.

Southern (standard brands).....	23.00@ 23.50.
" (other brands).....	18.00@ 18.50.
Lake Superior.....	22.00@ 22.50.

Philadelphia.

Oct. 5.

[From our Special Correspondent.]

Pig Iron.—The entire iron market has shown a rather quiet aspect since Monday, and there are fewer inquiries to-day than usual. Brokers who have sold a great deal of material for forward delivery say they are just as well satisfied with the temporary lull as though they were taking large orders. They profess to have information from consumers that very heavy orders will be placed late in the month or early in November. Production is still increasing in the anthracite region, but the maximum output that may be reached by midwinter is not likely to create any surplus, or to weaken quotations on standard or special makes. The very best makes known in the market are not to be had, except by ordering away ahead, and even then higher prices are asked than have yet been named. As Southern irons are making no impression upon this market, home makers are having everything their own way. No. 1 sells at about \$18, with \$18.50 as an asking price for a half-dozen makes. No. 2 averages \$17. Forge irons are quoted as usual, at about \$15.50, with 25 cents more or less for quality.

Blooms.—Quotations have varied during the week, according to the amount of material wanted and con-

dition of works. Nail slabs are held with a good deal of firmness and confidence at \$33; tank material as high as \$35; shell material, outside price, \$49; flange, \$42, and fire box, \$43. Makers might shade these figures a little, but the general impression is that these will be bottom figures before the end of the month. Charcoal blooms are strong at \$52@54, but no important transaction has taken place; anthracite, \$42@43; stocks light; scrap, \$33.

Spiegeleisen.—Brokers are trying to get \$33, and are refusing to sell at less. Manganese running 80 per cent. was quoted to-day at \$80@85.

Muck Bar.—The week has been quiet, but there are several buyers ready to place orders as soon as terms can be made to suit. Quotations, \$29@30.

Merchant Bar.—The extraordinary output of the merchant bar mills has partially overtaken the demand, and, while prices have not receded, consumers have taken note of the slight change in the situation. Quotations are 1 70 for common, which is in rather better demand than other kinds, and 1 90@1 95 for refined.

Nails.—Makers here are quoting 5 to 10 cents higher to-day on small lots, and buyers who have been running with low stocks are now offering to take nails at last month's prices. Car lots are \$1.90.

Skelp Iron.—This week's largest transaction was 1,000 tons of grooved iron at 1 85; sheared is 2 10@2 20. The outlook is still as favorable as it has been for months past.

Wrought Iron Pipe.—The advancing tendency is clearly observable to-day; and as there is a good deal of business to be placed this month, makers are anxious to profit by it. Discounts are 50 per cent. off for butt welded. The demand for tubes is very heavy, and some large buyers are negotiating this week for supplies to be delivered after January 1st.

Sheet Iron.—On some makes prices have been advanced. There have been large store sales this week, and galvanized is in particular request, with discounts on common at 65 off.

Plate Iron.—Specifications have just come to hand for several large lots, and buyers have not found manufacturers ready to shade prices to secure the business. A slight advance has been made, and tank plates are now 2 30 for exceptionally prompt deliveries, 2 20 on more convenient sales. Shell iron is as usual, 2 50 to 2 60, but there is a heavier demand this week. The ship-yard requirements keep at maximum limits.

Structural Iron.—The only possible comment to make upon the facts as given this week is that prices are firm and an advance is probable. On some business that has been presented higher figures have been made, and it is probable that they will be accepted. The greatest difficulty encountered is to make deliveries to suit the varying requirements of customers. Bridge plate is quoted at 2 20 to 2 30; angles, 2 25. Quotations were made for tees at 2 65, and on beams and channels, 2 80.

Merchant Steel.—Crucible, spring, and all other kinds are in very active demand at full prices.

Steel Rails.—Rumors are afloat to-day from Western markets, to the effect that large orders are about being placed at Chicago for Western roads. Quotations on small lots were made yesterday at \$31 here; but in competitive bids prices have been put down to \$29. There are a good many buyers making inquiries and they are evidently alarmed at the recent strength ening symptoms.

Old Rails.—Buyers are acting in a very cautious way about rails; they have been asked by brokers to make bids, but do not accept the invitation. The holders are evidently counting upon an advance to \$27, delivered. Quotations may be given vaguely at \$24 to \$25.

Scrap.—The demand for scrap is in excess of the supply, especially for the particular stock wanted. Choice is picked up as fast as it is promised at \$23; fish plates are nominally \$25; car lots of scrap, \$22.50.

Pittsburg.

Oct. .

[From our Special Correspondent.]

Raw Iron.—The activity we have noted for some weeks past continues. There is no let up in the demand, but rather an increase, with higher prices than those current last week, the largest demand being for Bessemer. One of the leading firms purchased during the past ten days 30,000 tons Bessemer at prices varying from \$18.40 at the furnace to \$19.25, delivered.

In former years an advance of, say, \$1 per ton would have caused parties not engaged in the business, who had a few thousand dollars, to purchase iron on speculation and hold for an advance. During the present movement in iron the sales have been made for legitimate purposes, so far as could be ascertained not a ton for speculative purposes. This is as it should be, and shows a healthy condition of affairs. The undertone for most descriptions is one of great strength, and why not? The advance in coke alone has increased the cost of iron 80c. per ton. Freight has advanced from 15c. to 20c. Many predict that coke will go still higher in the near future. Every department of trade is flourishing. The mills and foundries have all they can do, with plenty of orders on hand. Furnacemen have all the orders booked they want, and are very happy. Muck bar is firm and higher, and so are blooms and billets; old rails are firm at current rates. Ferro-manganese and spiegel are away up and still climbing. Imported manganese sold at \$77.40@82.40, the highest price attained for years.

The present outlook is about all that could be desired. Consumption is maintained at the highest limit of the year, certainly the highest on record, with probabilities favoring a still further increase before there is any reaction.

Taking a broad view of the situation, it may be safely asserted that sellers are in a very strong position: favorite brands, as before stated, are scarce, and as they are nearly all engaged for some time ahead, needy buyers must pay a slight premium for spot delivery. Steel rails firm. We note sales of 8,000 tons at works \$31@32 cash.

Coke and Coke Smelted Lake Ore.	
3,000 Tons Bessemer	18.50 cash.
3,200 Tons Bessemer Valley Furnace	18.00 cash.
2,000 Tons Bessemer	18.50 cash.
2,500 Tons Gray Forge	15.85 cash.
2,000 Tons Bessemer, at furnace	18.40 cash.
1,200 Tons Bessemer	18.30 cash.
2,000 Tons Gray Forge	16.00 cash.
2,000 Tons Bessemer	19.00 cash.
3,000 Tons Bessemer	16.10 cash.
1,500 Tons Gray Forge	19.15 cash.
1,300 Tons Bessemer	19.00 cash.
550 Tons White Iron	14.75 cash.
2,500 Tons Bessemer	18.80 cash.
1,000 Tons Bessemer	19.00 cash.
100 Tons Mottled	14.75 cash.
1,200 Tons Bessemer, at furnace	18.00 cash.
Coke, Native Ore.	
1,000 Tons Gray Forge	16.00 cash.
500 Tons Gray Forge	15.75 cash.
250 Tons Gray Forge	16.00 cash.
500 Tons Gray Forge	16.00 cash.
150 Tons Silvery	16.50 cash.
50 Tons Mottled and White	14.50 cash.
Muck Bar.	
2,000 Tons Good Neutral	29.00 cash.
2,000 Tons Good Neutral	29.50 cash.
1,500 Tons October to January	29.00 cash.
1,000 Tons November	29.00 cash.
Steel Wire Rods.	
700 Tons American Fives	44.00 cash.
500 Tons American Fives	44.50 cash.
Steel Bloom Ends.	
1,000 Tons Bloom Ends	21.00 cash.
500 Tons Bloom Ends	23.50 cash.
Old Iron Rails.	
1,150 Tons American Ts	27.00 cash.
2,700 Tons American Ts	27.00 cash.
Ferro-Manganese.	
200 Tons 80 per cent., f.o.b. cars Balt.	85.00 cash.
200 Tons 80 per cent., imported	82.40 cash.
100 Tons 81 per cent., imported	77.40 cash.
50 Tons 80 per cent., imported	78.80 cash.
Spiegel.	
190 Tons 20 per cent.	40.00 cash.
80 Tons 20 per cent.	40.00 cash.
75 Tons 10 and 12 per cent.	35.52 cash.
Steel Slabs and Billets.	
1,700 Tons Steel Billets	33.00 cash.
1,000 Tons Steel Billets	33.25 cash.
1,000 Tons Steel Billets	33.00 cash.
2,500 Tons Rod Billets	32.50 cash.
500 Tons Billets and Slabs	33.50 cash.
Sleep Iron.	
700 Tons Sheared, per 100 lbs.	2.25 4 mo.
300 Tons Wide Grooved, per 100 lbs.	1.92½ 4 mo.
300 Tons Narrow Grooved, per 100 lbs.	1.82½ 4 mo.
Prices.	
Coke or Bituminous Pig.	
Foundry No. 1.	\$17.25@17.50
Foundry No. 2.	16.25@16.75
Gray F. No. 3.	15.75@16.20
No. 4.	15.25@15.35
White	14.50@14.75
Mottled	14.50@14.75
Silvery	16.50@19.00
Bessemer	18.50@19.00
Low Phos.	21.50@22.00
Charcoal Pig.	
Foundry No. 1.	23.50@24.50
Foundry No. 2.	22.00@22.25
Cold-Blast	25.00@26.00
Warm-Blast	24.00@25.00
10 + 12% Speigel	33.50
20% Speigel	40.00
Muck-Bar.	
Muck-Bar.	29.10@29.50
Steel Blooms.	33.00@34.00
Steel Slabs.	33.00@33.25
Steel Cr's Ends	22.00@22.50
Steel Bl. Ends.	23.00@23.50
Ferro-Man., 80%	77.40@82.40
Old Iron Rails.	26.50@27.60
Old Steel Rails.	18.00@20.00
No. 1 W. Scrap.	19.00@19.50
No. 2 W. Scrap.	17.50@18.00
Steel Rails.	31.00@32.00
" light sec.	31.00@34.00
Bar Iron, nom.	1.80@1.90
Iron Nails.	2.10@2.15
Steel Nails.	2.10@2.15
Wire Nails.	2.20@2.25

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Oct. 4.

Heavy Chemicals.—The demand for caustic soda continues large and supplies light; prices have further advanced. We now quote for 60 per cent. \$2.52½@ \$2.55; and for 70 and 74 per cent., \$2.32½@ \$2.37½. Advertis from abroad report that makers meet with increased demand from the Continent, and goods are being pushed forward as fast as possible before the close of navigation. Of course this activity is likely to be only temporary, but it is believed that the increased cost of raw materials will continue to strengthen prices and to sustain the market for some time to come, in spite of the collapse of the combination scheme.

Bleaching powder is a little firmer, and we get quotations of \$1.70@ \$1.75. The outlook for the future, however, is not improving, and we learn of offers to contract for next year as low as \$1.60; furthermore, these offers have been made without acceptance.

The demand for carbonated soda ash has developed very liberal proportions, and prices are very firm at last week's quotations. For 48 per cent. we quote \$1.20 to \$1.25.

There is not so much activity in caustic soda ash, and the market may be termed quiet at \$1.25, 48 per cent.

English brands of sal soda are held at slightly higher figures, 95c. to 97½c. being asked. American brands are firmer, but not quotably changed.

Acids.—The regular meeting of the acid manufacturers was held in the rooms of the Fulton Club on Wednesday afternoon; some 12 or 13 members were present. No plan of permanent organization was pre-

sented, as there are still some details in it to be arranged. It is expected, however, that these matters will be settled at a special meeting shortly. It has been determined that there is no serious objection on the part of the manufacturers to enter a more permanent organization than is at present existing. In the proposed plan some slight inequalities in the present price-list may be adjusted, but it is not thought that any changes of importance will be made. Trade continues usually good, and, in fact, some of the manufacturers have been obliged to buy of one another in order to supply orders.

Fertilizing Chemicals.—In the words of one of the most energetic members of the trade, "business is nothing to brag of." Northern buyers of crude fertilizing material by this time have, in nearly all cases, supplied their fall needs, and are not in the market to any great extent, although we understand that some of the more speculative have been looking around for desirable purchases for next spring's consumption. If ammoniates are really obtainable at some of the quotations we have heard, such purchases can indeed be advantageously made at present.

There have been some inquiries from the South, but the season there appears to be rather backward. In fact, the South appears to be purchasing less fertilizing material from the North, both crude and in the shape of "complete fertilizers," every year. Fertilizer factories and sulphuric acid works have been erected all through the South of late years, and their competition is now very naturally felt by Northern manufacturers. Northern dealers in crude material suffer from the growing use of acid phosphate, acidulated Charleston phosphate rock, in the Southern section, which, although it supplies only one constituent of an ideal fertilizer—phosphoric acid—is looked upon with great favor by the Southern agricultural community.

This feature of the trade is by no means unexpected. It is, and has been apparent that the establishment of sulphuric acid plants in the South must sooner or later put a stop to the practice of shipping rock from Charleston, S. C., so near to the center of the fertilizer consuming district, to New York factories, treating it here with sulphuric acid, and reshipping it to the South, a process in which the item of freight alone is one of great importance. Much of the Southern fertilizing trade may thus leave New York, as the various Stassfurt salts can be shipped direct to Wilmington or Charleston without the intervention of New York dealers, and tankage, bones, etc., and other Chicago products can also find their way there direct.

This will not happen all at once, but, appreciating the natural tendency of trade, Northern manufacturers are beginning to more thoroughly canvass their own section of the country, and to extend their markets into Western districts, Ohio, Illinois, etc., where the soil shows exhaustion.

The Fertilizer Exchange meets next Tuesday afternoon at half-past two o'clock at the office of the president, Mr. Charles V. Mapes, 158 Front street. Among the more important questions which will probably be discussed is that of "credits." Long-time payments constitute a growing evil of the trade. The farmer has been so "coddled" and "protected" by demagogic legislators that he has become very independent when purchasing his fertilizers and, always insisting that no payment shall be made until after the returns from the crops have been received, he sometimes goes so far as not to pay at all. On the other hand, the fertilizer maker is often obliged to pay cash for his material, and thus even those with the largest capital are sometimes embarrassed by the delinquency of their debtors.

In the local market this week the chief feature has been the continued weakness of ammoniates. Values really are unsettled, and it is difficult to determine the actual basis on which sales can be made. Last week we noted that low grade city soft blood had been quoted as low as \$2 per unit, and although we get this figure again this week, one of our leading and most reliable dealers asserts most emphatically that nothing can be bought at less than \$2.10. Western high grade blood is quoted by some at \$2.25, while others name as low as \$2.15. Azotine is also rather unsettled, quotations ranging from \$2.05 to \$2.15.

For tankage we get these quotations: High grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, \$22@ \$22.50 is quoted, and low grade, 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, \$21@ \$21.50. Other articles are quoted as follows: Fish scrap, \$22@ \$23 per ton, f.o.b. factory. Sulphate of ammonia at \$3@ \$3.05 per cwt. Concentrated tankage, \$2.15@ \$2.20. Refuse bone-black, guaranteed 70 per cent. phosphate, \$20@ \$21 per ton. Dissolved bone-black is 92½c. @ \$1 per unit for available phosphoric acid, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, \$20 @ \$23.50; ground, \$27.

Charleston rock, undried, \$5.50@ \$5.75 per ton; kiln dried, \$6.75 @ \$7 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, \$11, ex-steamer at New York.

Muriate of potash.—Arrivals of 450 tons are reported. As we have previously noted, there is something of an accumulation on the spot, but in regard to this the syndicate's sales agents say that stocks are always large in both first and second hands at this date in order to meet the regular October demand when actual consumption begins. We continue to quote the syndicate price, \$1.80 per 100 pounds.

Double manure salt is moving lightly. On the basis of 48 per cent. potash, we quote \$1.20 per 100 pounds on the spot and \$1.15 to arrive. High grade manure salt, or sulphate of potash as it is really called, basis 90 per cent. potash, is quoted at \$2.32½ for the few hundred tons in store, for which there seems to be little inquiry.

Kainit.—No new business of importance can be recorded since the date of our last report. There is no doubt that for inland trade, where the cost of transportation is an important consideration, that muriate of potash has some advantage over kainit. Its cost is about \$40 per ton to \$10 for kainit, but as one ton of muriate will yield about as much actual potash as four of kainit, there is, of course, a great saving in bulk, and consequently in freight charges, in using the former. Kainit, nevertheless, is a fertilizer, the sale of which in years past has been so judiciously and energetically pushed that it is a great favorite in many quarters. We quote the official price, \$10 per ton actual weight, and \$9.75 per ton foreign invoice weight.

We call attention particularly to our London letter in another column, which gives an accurate report on the fertilizer market of the United Kingdom.

Miscellaneous.—Nitrate of soda is firmer at \$1.87½@ \$1.90.

F. B. Nichol's statistics issued this week show that the supply on the market has slightly decreased. Arrivals during the fortnight ending October 1st, aggregated 18,462 bags received in almost equal parts in New York, and Boston deliveries amounted to 23,412 bags, a notable increase over the business of preceding fortnights. The spot stock is thus diminished to 57,858 bags on the 1st inst. of which all but 4,000 bags are in New York City. Mr. Nichol says: "Considerable spot business was done in the fortnight, about 15,000 bags in store, which may be followed by higher prices. The constant arrivals have not interfered with the steady reduction of warehouse supply. Our statement does not show the actual business, because only a portion of the quantity transferred from dealers to consumers has left the stores. We try to give the actual situation by giving the stock in dealers' hands, which is 30,000 bags, against 62,000 same time last year. The market closes fairly firm at 1'90. The forward business was unimportant. The Valparaiso market for futures is above the views of our buyers and does not give way. The arrivals were "Sultana," at Boston, and "Grandee," at this port. Our list to arrive does not include three distressed vessels whose movements ultimately are not yet known."

Brimstone is quiet at \$19.50 for seconds, and \$19 for thirds.

NOTES OF THE WEEK.

Fertilizer Exchange meeting next Tuesday afternoon.

The next regular meeting of the acid manufacturers will be held on October 16th.

Mr. H. H. Salmon, Jr., has returned from a visit to the great Stassfurt salt mines.

London. Sept. 17.

[Couper, Miller & Co.'s Report.]

The feature of the month is the great London strike, which has more or less paralyzed all our industries on a spot; in fact the largest of our fertilizer works shut their doors on its operatives, preferring rather to close than be coerced. London, however, is not the United Kingdom, and prices of all raw materials have been well supported and a considerable business done.

Mineral Phosphates.—Canadian phosphate shipments have again been delayed through the freight difficulty, for only as ballast can this rock come forward. Contracts have, however, been so far implemented, but the season is rapidly drawing to a close, and large quantities have still to be shipped. We hear of no late sales of 80 per cent., but 70 per cent. has been done lately at 10½d., with one-fifth rise. South Carolina, in large steamer cargoes, commands 10½d. per unit, but the United States market is active, and more can be realized there than here, which accounts for short supplies. Some phosphates are in limited supply, 70 per cent. and over being fully sold, while but little of the lower grades is available. The unprecedented demand in France has astonished every one, and it is hard to say how this is to be met when the Somme supply is exhausted. Belgian continues in request, but the higher tests have all been absorbed in France, etc., and there is only 40 to 45 and 45 to 50 per cent. available, prices on application.

Bone Ash, Bones and Meal.—No cargoes on offer, but a cargo of R. P. ash sold lately at about \$4 15s. Bones inquired for at the outports, and large sales reported of Bombay meal at £5 3s. 9d. to Liverpool.

Nitrate of soda is quoted at 8s. 6d. spot ordinary, and 9s. per cwt. for refined. Sulphate of ammonia is quoted at £12 to £12 2s. 6d.

Ammoniacal materials in active demand. Fish guano testing 9½ to 10 per cent. Ammonia and 16 to 18 per cent. phosphates we are selling for prompt delivery at 9s. 6d. and 1s. 3d. per unit respectively, delivered to vessel at works in Thames in buyers' bags, and can contract for forward at slightly advanced figures.

Muriate of Potash.—We quote at £7 9s. on 80 per cent. in bags, kainit at 28s. in bags or 25s. in bulk f.o.b. Hamburg in lots of not less than 50 tons. Net cash. Stassfurt weight and sampling.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Oct. 4.

The old contest between Peck, Martin & Co. and the trades unions was renewed this week, and has been the chief topic of conversation in building material circles in New York and adjoining cities. Beginning on Friday last the laborers employed on the following buildings, for which this firm is supplying material, were called out: The Union Trust Company's building on

Broadway, near Wall street, David H. King, Jr., builder; the Wilkes Building, corner Broad and Wall streets, L. A. Burke & Co., builders, and another at Leonard & Baxter streets, being erected by Messrs. Horgan & Slatery.

The inconvenience has fallen mainly upon the contractors, who have been greatly thrown back in their work, and, as they have always employed union men, they feel that they have been unjustly treated.

Finding that the attempted boycott was unavailing, the board of walking delegates ordered the men to return to their work on all three buildings yesterday, and the strike may be considered as practically ended.

A meeting of the Building Material Exchange was held Wednesday afternoon at the call of the president, Mr. R. C. Martin in a few words explained the cause of the boycott, and said that while Peck, Martin & Co. had not requested this meeting, they wished that the members of the Building Material Exchange would take such action as would be best for the interest of the trade.

with Messrs. Peck, Martin & Co. Attention was then called to the fact that some time ago, an association of dealers was formed for the purpose of mutual protection and at this time Messrs. Peck, Martin & Co. refused to become members.

This meeting was held this afternoon at 3:15 P. M. Bricks.—Arrivals of brick this week have been lighter than usual and prices are rather stiffer.

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IMPORTS AND EXPORTS OF METALS AT NEW YORK SEPTEMBER 21 TO SEPTEMBER 26, 1889, AND FROM JANUARY 1.

Table with multiple columns for metal types (Iron, Steel, Copper, etc.), units (Tons, Casks, Boxes), and values. Includes sub-sections for Imports, Pig Iron, Steel Sheets, Forging, etc., and Exports for various metals.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Assessments. Includes entries for Adams & Silver, Alpha Cons., and many others.

G. Gold, S. Silver, L. Lead, C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Dead wood previously paid \$275,000 in level 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, \$240,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1886, the Copper Queen had paid \$1,350,000 in dividends. †† 1,000,000.

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 Sept. 25 to Oct. 4, and Sales figures.

*Ex. dividend †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment unpaid Dividend shares sold, 15,705. Non-dividend shares sold, 26,915. Total New York, 42,620.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names and prices from Sept. 27 to Oct. 3.

Boston: Dividend shares sold, 11,222. Non-dividend shares sold, 7,950. Total Boston, 18,572.

COAL STOCKS.

Table of Coal Stocks, listing company names and prices from Sept. 28 to Oct. 4.

**Of the sales of this stock, 46,343 were in Philadelphia, and 132,195 in New York. Total sales, 261,343.

San Francisco Mining Stock Quotations.

Table of San Francisco Mining Stock Quotations, listing company names and closing quotations from Sept. 27 to Oct. 3.

STOCK MARKET QUOTATIONS.

Table with columns: COMPANY, Bid, Asked. Includes Baltimore, Md. stocks like Atlantic Coal, Balt. & N. C., Conrad Hill, etc.

Prices bid and asked during the week ending Oct. 3d, 1889.

Birmingham, Ala.

Table with columns: COMPANY, Bid, Asked. Includes Ala. Con. C. & C. Co., Ala. R. Mill Co., Alice Furnace, etc.

Prices bid and asked during week ending Sept. 30th.

* Bonds. † First mortgage. †† Second mortgage.

Kansas City, Mo.

Table with columns: COMPANY, Par value, Bid, Asked. Includes Ben Harrison, Burch, L. & Z., Mo., Hillshoro Gold, etc.

Pittsburg, Pa.

Table with columns: COMPANY, H., L., Closing. Includes Allegheny Gas Co., Bridgewater Gas Co., Chartiers Mfg. Co., etc.

St. Louis.

Table with columns: COMPANY, Bid, Asked. Includes Adams, Colo., American & Nettie, Arizona, etc.

Table with columns: COMPANY, Bid, Asked. Includes Golden King, Golden West, Gold Pioneer, Gold Run, etc.

Electric Stocks.

Table with columns: COMPANY, Par value, Market price. Includes Brush, Illuminating, Daft, etc.

Trust Stocks.

Table with columns: COMPANY, Sales, H., L. Includes American Cotton Oil, Cattle Trust, Distillers' & Cattle Feeders', etc.

Foreign Quotations.

Table with columns: COMPANY, Highest, Lowest. Includes Alturas Gold, Idaho, Arizona Copper, California Gold, etc.

Paris.

Table with columns: COMPANY, Bid, Asked. Includes Belmez, Spain, Boleo, Mex., Callao Bis, Venez., etc.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Table listing prices for various chemicals and minerals: Acid-Acetic, Muriatic, Nitric, Oxalic, Sulphuric, Alkali, Alum, Aqua Ammonia, Arsenic, Asbestos, Asphaltum, Barytes, Bleach, Borax, Brimstone, Bromine, China Clay, Chrome Yellow, Cobalt, Copper, Coppers, Cream of Tartar, Emery, Feldspar, Fuller's Earth, Gypsum, Iodine, Kaolin, Lead, Lime Acetate, Litharge, Magnesite, Manganese, Mercuric Chloride, Mineral Wool, Mica, Ochre, Phosphate Rock, Plumbago, Potassium, Pumice Stone, Pyrites, Quartz, Rotten Stone, Salt, Soda Ash, Sulphur, Strontium, Sulphur, Talc, Vermilion, Vitriol, Zinc Oxide.

THE RARER METALS.

Table listing prices for rarer metals: Aluminum, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Glucium, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Osmium, Palladium, Platinum, Potassium, Rhodium, Ruthenium, Rubidium, Selenium, Sodium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Thorium, Tungsten, Vanadium, Yttrium, Zirconium.

RARE MINERALS.

Table listing prices for rare minerals: Molybdenite, Gadolinite, Zircon, Cerite, Orthite, Rutile, Thorite, Ytrotitanite, Columbite.

BUILDING MATERIAL.

Table listing prices for building materials: Bricks, Building Stone, Cement, Lime, Slate, Red roofing, Black roofing, Portland Cement, Roman Cement, Keene's coarse, Keene's fine, Labor.

THE ENGINEERING AND MINING JOURNAL will thank

any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.