

# THE ENGINEERING AND MINING JOURNAL



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The article on the Michipicoten copper mine, which appeared in the ENGINEERING AND MINING JOURNAL August 6th, under the name of Mr. HERMAN POOLE, should not have been credited to him, since, though he courteously furnished the geological description and the illustrations of the mine, he was not responsible for the statements concerning the results of working the mine and should not have been credited with them. Mr. POOLE calls attention elsewhere to these facts. We greatly regret this occurrence and the more so if our remarks have done injustice to the property. We understand that Mr. RATTLE, mining engineer of Cleveland, has recently examined the mine, from which the water has been pumped, and has expressed a favorable opinion of it. Efforts are being made to have the property worked.

The committee appointed by the Board of Directors of the Savage Mining Company of the Comstock Lode, report that they find the mining industry of Storey County "suffering from an incubus of monopoly and excessive charges." The water, railroad and lumber companies have all maintained the rates of the palmiest days of the Comstock, while the nominal costs of milling have been reduced from \$14 a ton to \$7, and, in cases, even less. In all these concerns the Bonanza people are interested owners and profit sharers. Attention has been called to the Virginia & Truckee Railroad in particular. This company, built by the subscriptions of the people and the mining companies, has been able to maintain its dividends for over 20 years, to the detriment of those who built it. To this state of affairs the ENGINEERING AND MINING JOURNAL has often called attention. The Comstock ring is not content with direct robbery alone, but bleeds the assessed stockholders at every opportunity.

At the end of June of the current year, mining upon the Randt gold fields in South Africa had been in existence five years. During this period 2,429,694 ounces of gold were produced, valued at \$42,000,000, the average grade of ore milled being about \$12 per ton. The production for the present year bids fair to exceed 1,100,000 ounces. It is entirely safe to say that no gold mining district relying upon vein mining alone has ever shown such a record as this, although the immense advantage of practically unlimited capital must not be overlooked. It is probable that the marked increase from 323,142 ounces in the first half of 1891 to 562,704 ounces in the first half of 1892, or over 74 per cent., will be even exceeded in the future.

Deep mining is in its incipency, and a syndicate of able mining men and capitalists have practically secured this field. (It will be remembered that the locations in the Transvaal are square, and work in depth is limited by the side lines.) Claims parallel to the best of the proved reefs have been secured to the number of 650 by one syndicate alone, and, aided by the great capital at their command, undoubtedly the mining industry of the Randt will receive a second stimulus in no ways less pronounced than the last.

The Denver Mining Stock Exchange, wishing to purify the transactions on its board, and recognizing that if a stock is quoted there it is virtually indorsed by it and its members, has quite wisely made a rule that all companies which do not regularly report to the Exchange and show evidence of good faith shall be struck off the lists. This example, it is hoped, will be followed by the Consolidated Stock Exchange, of New York. The members of this exchange have complained for years, and not without reason, of the dullness of the market and indifference of the investing public to mining stocks, yet this lassitude is due in a large degree to the management of the exchange in allowing worthless, and sometimes fraudulent, stocks to be dealt in under its protection.

In the palmy days of mining promotion, when mines, good or bad, met with ready purchasers, this exchange was organized and in the excitement of "boom times" not a few worthless mines were listed. The result of permitting their stock to be dealt in was inevitably the disgust of investors with "mining" in general and the belief which is held by many that such a mining stock exchange is an enemy to legitimate mining. It is the utmost folly for the Exchange to permit transactions in a stock like the Sullivan Consolidated, of South Dakota, to the utter worthlessness of which we have repeatedly called attention. It should be stricken off its list at once, as should also a number of others.

Several members of the Exchange, either in official or private commission, have been traveling recently in the West endeavoring to resuscitate business in mining stocks. The ENGINEERING AND MINING JOURNAL, which has the good of all legitimate mining enterprises at heart, hopes that they may be successful, but it would call the attention of these gentlemen and their fellow members to the fact that the true elixir of life in a stock exchange is honest dealing, and so long as they permit worthless not to say fraudulent, stocks to be dealt in on the Exchange, there can be no real public interest in mining stock investments.

## THE COST OF PRODUCING SILVER.

Undoubtedly the heavy decline in the market price of silver is a very serious matter with many of our mines, and is a far greater injury to the country than a similar decline in iron, coal, lead, zinc, copper, etc., for when these decline in price and their production becomes unprofitable, the low price creates new markets and stimulates other industries and benefits the country generally. Since silver is a luxury, and as a heavy decline in its price has little influence in creating or stimulating any other industry, the loss to the miner is a loss to the whole country not offset by any material advantage. Nevertheless, it is the part of wisdom to look at facts as they are, and not base our actions on conditions that we would like to see realized, but which we know are unlikely to come about.

Mr. H. KNIPPENBERG, general manager of the Hecla Consolidated Mining Company, of Montana, looks at the situation as it is, and asks his company whether, under the present and prospective low prices of silver, he shall continue to work or close the mine, and he publishes the following statement of costs covering the past ten years:

GLENDALE, Mont., August 15th, 1892.  
To the Stockholders of the Hecla Consolidated Mining Company: Herewith I submit a statement showing cost per ounce of silver produced (leaving lead out of the consideration) by this company during the past ten years. Silver sold in New York August 13th, 1892, at 82½ cents.

Year.	Total oz. produced.	Total pay-roll.	Cost per oz. silver.	Year.	Total oz. produced.	Total pay-roll.	Cost per oz. silver.
1882.....	534,197	\$619,536.08	\$1.15	1887.....	\$474,719	\$424,081.24	\$.89
1883.....	662,835	576,272.10	.87	1888.....	716,859	626,196.33	.88
1884.....	656,849	564,510.69	.86	1889.....	579,430	517,522.34	.93
1885.....	686,845	591,519.49	.86	1890.....	480,904	454,360.37	.94
1886.....	398,707	429,150.96	1.08	1891.....	485,209	445,370.29	.92

Average cost per ounce for 10 years, 92½ cents.

The lead and copper output of the Hecla Consolidated are not inconsiderable, and should have been taken into account, instead of charging the entire cost of working the mine against the silver produced. We, therefore, hope that the mine—one of the best managed in this country and a fine property—is paying something to its stockholders even at the present price of silver, while if it were stopped a considerable amount would still have to be expended for caring for the property, for depreciation, etc., and there would be no offset. The great question is what is the market price of silver likely to be in the future.

## PROBLEMS TO COME BEFORE THE INTERNATIONAL SILVER COMMISSION.

The approaching meeting of the International Silver Commission is of far greater importance than that of any previous commission, for at the present time the enormous decline in the value of silver has brought us face to face with a problem gradually affecting the people of the whole world. It is no longer possible to "wait and see," or to defer action on this momentous question. Either some joint action must now be taken to support the value of silver or silver will at once and inevitably descend in every part of the world to a condition of a mere commodity like copper, to be used in token coinage and whose value will be regulated, as is that of copper, except in the case of temporary "corners," strictly by supply and demand, and the demand under these circumstances would unquestionably be so small that the price of silver would quickly decline to a point which would close temporarily the greater part of the world's silver mining. The adoption of free silver coinage by one country—even if it should be the United States—in addition to India, Mexico, Japan, etc., would not postpone, but rather hasten this disastrous consummation.

There is absolutely no device or scheme for the betterment of silver that is of the least value unless it provides a gold paying market for the metal which will permit any holder of silver to exchange it for gold at a fixed and unvarying ratio. Since 1873, when silver was "denomitized" in the United States (and, according to free coinage advocates, the "demand" for silver ceased), the purchases by the Government have steadily and rapidly increased until during the last two years the Government has been buying practically the entire output of this country and paying for it in gold or in certificates that are redeemable in gold.

If this country were to adopt free silver coinage this gold-paying market would at once be closed, and silver, whether coined in legal tender dollars or not, would be worth what it would bring, directly or indirectly, in gold, in the markets of the world, precisely as is the case in India and Mexico to-day, and the disaster and distress that are now existing in or impending over those free coinage countries would be ours also.

It must be very evident to every one who gives the subject a moment's serious thought that if silver were worth more in gold here than in India and the rest of the world all their silver would come here and would take our gold in exchange, so that in a moment, as it were, we would have only silver with which to pay for producing our cotton, grain, copper, and all other articles whose values here are regulated by their gold values in the European markets. The gold value of silver would assuredly go down far below any figure yet reached.

If free silver coinage would therefore inevitably deprive us at once of over \$680,000,000 gold, which is much more than half of all our money, depress the gold value of silver and bring us down to bartering a fluctuating

silver for other commodities of fluctuating values, this country would suffer a commercial and industrial disaster which would place it entirely at the mercy of the gold standard countries, and from which it would not recover in fifty years. Yet the United States, being a very rich country, could stand the loss on, say, \$600,000,000 of silver, far better than the European countries, which have fully \$1,000,000,000 of full legal tender silver coins in circulation, at the ratio of 15½ to 1—and then India and Mexico, with their enormous circulation.

It is evident that what is to the interest of the United States is equally to the interest of all the great commercial nations, and common action to support the value of silver is desirable to each, and to none more than to Great Britain, with its free coinage India and its great silver producing colonies. There should be no insuperable difficulty in bringing about an agreement among the representatives to the silver conference upon a subject in which all have a common interest in reaching a safe and durable solution of the problem. What means can be adopted to attain this desired end is a question which calls for a careful consideration of the statistics of silver and gold, and of the data from which can be foreseen the probable future consequences of any proposed solution of the problem.

Is silver to be relegated as copper has been to the position of a token money of limited legal tender function and can the growing commerce of the world be carried on with gold alone as the ultimate money of redemption, or is it absolutely essential that silver be also made temporarily a universal money of ultimate redemption on a fixed ratio with gold, and if so, what ratio should be adopted? These are a few of the questions which will come up in the meetings of the International Silver Commission, and we propose to discuss them fairly and dispassionately, with the sole object of reaching the truth, and the best solution for the interests involved. Our columns will be open to correspondence on this subject, but we must request brevity on account of the heavy demands on our space.

## LABOR AND ARBITRATION.

In my article, last week, on "Labor and Law," I gave, as an illustration, a possible contract between employer and employé, under which the latter would become, by an actual money-deposit, responsible parties. Before passing to the special topic of the present article, I will briefly notice one or two objections to the plan suggested.

1. It may be said that the money forfeit (in the case supposed, one month's wages) should not be held by the employer. The reply is that, if the employé so stipulates, the deposit can be held by a disinterested trustee. But the solvency and integrity of such a trustee will then be involved; and he will, perhaps, have to be paid for his services, thus increasing the complexity and cost of the arrangement. On the other hand, employés in large establishments have, as an almost universal rule, no doubt at all of the pecuniary ability and honor of their employers. The proofs are innumerable. They prefer "the company" or "the firm" to a savings-bank. During the last great anthracite strike, the strikers left on deposit with the employers against whom they were "waging war," large sums of money, representing their earnings. And I have heard of no case in which employers, holding the savings of their workmen, have refused to repay them on demand, or have attached them by legal process, on account of any claim for damages.

2. It may be said that the amount, suggested as an illustration, of one month's wages, is not large enough to cover possible damages or to deter employés from the violation of contract by a concerted strike without notice. The reply is manifold. The aggregate of such deposits for the employés of a large concern would be no trifling sum. Again, any such guaranty is much better than none at all. Again, the forfeit payable by the employer in each individual case should be as great as that payable by the workman; and it is not likely that employers would willingly incur extremely large total liabilities of this character. Finally, the forfeit would not be intended to cover in fact all damage done by the act of either party. Nor would it be the penalty of a violation of contract. It would be simply the price at which certain described acts could be done by either party, without violating the contract. The employer agrees that he will either not do certain things, or else, if he does them, he will forfeit a certain sum. The workman agrees that he will not do certain things, or else, if he does them, he will forfeit a similar sum. On either side (apart from acts punishable by criminal law) such things as a sudden strike or a summary discharge without cause are not violations of the agreement, but the exercise of an option provided in it. The question therefore is, Will a small forfeit, attached to such an option, effectively prevent the occurrence of frivolous strikes, on the one hand, and of petty tyrannies on the other?

On this head theorists may entertain a doubt; but business men have none. Whoever has observed how promptly a millionaire will attend a directors' meeting if there be a gold half-eagle, or even a quarter-eagle, awaiting him as a fee, will appreciate the moral effect of a small amount of money upon the human imagination. It is not that the millionaire thinks \$5 a prize worth great exertion, or even fair payment for his time;



but only that, in the absence of special reason to the contrary, he will not throw away \$5 which he could have by simply going for it. Ten to one he has become a millionaire by the practice of this very principle; and the instinct thus acquired rules him still. No matter how rich he may be he is not willing, in matters of business, to throw away the smallest sum. And this law of the human mind (universal, except as to spendthrift fools) would certainly operate in the management of large bodies of workmen. Beyond question, a manager or foreman who, by the summary discharge of an employé, should subject his own employers to a money forfeit, however small, would be called to account, just as he would be if he paid money for goods not received; and the certainty of this review of his acts, involving his standing, his chances of promotion, and perhaps his place, would be a mighty restraining force. Obviously, a small forfeit per workman would amount to so large a sum for all the employés of a great concern, that a provision such as I have supposed would absolutely prevent general changes of wages, time, etc., without the notice agreed upon. On the other hand, it is equally sure that workmen would not strike, without cause and without discussion, at the simple order of some committee, or for the mere purpose of expressing "sympathy," if every man lost immediately one month's wages by his act. And if, to avoid such a loss, thirty days' notice had to be given of an intended strike, such a notice would be very rarely given. Workingmen belonging to unions would quickly enough see to it that in all cases (as in some already) the larger organization should be deprived of the power to "order" strikes; that the employés of a given concern should always have the right to decide for themselves whether they would, for the sake of the object desired, sacrifice, not only their places, but their money forfeit. And since, in the vast majority of instances, the second sacrifice would be refused, and the first without the second would do no good, we should see under such a system a great diminution, perhaps a total disappearance, of the most injurious and the most perplexing of our "labor troubles."

I am sure that in the lines of business familiar to me, employers generally would welcome such an arrangement, and would gladly pay a high rate of interest on the forfeit money deposited with them, and make themselves responsible to the extent of all their capital for its safe keeping as a trust fund, and its prompt return according to agreement.

Here comes in the only valuable function of arbitration. There is no peculiar virtue and no all-embracing sphere for this method of settling disputes. Arbitration is simply a cheap, quick and crude substitute for the ordinary first trial of a case in the lower courts. Voluntary arbitration is a process of agreement, and its results can be enforced only by the means of enforcing any other agreement; that is to say, if either party to an arbitration refuses to accept its result, the dispute must be settled in the courts, which are not bound by the decision of the arbitrators. Nor can any agreement to an arbitration deprive either party of his ultimate and inalienable right to appeal for justice to the courts of his country.

Compulsory arbitration, on the other hand, is practically the creation of a new court, to try a particular issue. In either case, the tribunal is, as a means of ascertaining truth and executing justice, inferior in many respects to the regular courts, with their ample powers, established methods and complete machinery for the revision of errors. Experienced business men do not favor arbitration, except as a quick way of settling questions which they would rather settle somehow than fight about. The notion that it can be properly employed upon bitterly contested issues of vital importance to both parties; that it can deal with conflicts over which no court would have jurisdiction; that it can supersede the ordinary legal remedies to which every citizen is entitled; and that it could even be empowered, without mockery and outrage of justice, not merely to enforce existing contracts, but to force new ones—for instance, to compel an employer to raise wages, or an employé to accept a reduction of wages, not provided for in any existing agreement—is the wildest of sentimental superstitions.

In the case I have supposed arbitration might properly be agreed upon as the means of determining which party should pay the money-forfeit. A man is discharged professedly for some cause, specified in his contract, and releasing the employer from the payment of the agreed money-forfeit. It may very well be arbitrated, whether the alleged cause of discharge is true and adequate to such a release of the employer. But the utmost result of such an arbitration should be to require the employer to pay the money, not to reinstate the discharged man. For he would have had, under the circumstances supposed, the option to discharge a man *without* cause given, upon the payment of the fixed sum; and if the cause alleged were proved invalid, the case would become simply one of discharge without cause. The original agreement might properly provide that, in case of such an allegation of cause, subsequently disallowed by arbitrators, the forfeit due from the employer should be doubled, and that in case he still refused to pay it, and it had to be collected by legal proceedings, the amount should be doubled again. On the other hand, a workman claiming to have been discharged without cause, refusing on that ground to accept the return of his deposit, with wages to date, as payment in full of his dues,

and appealing to arbitration, might be bound by the original agreement to forfeit, if the verdict went against him, part or all of his original deposit, as well as the extra forfeit he had claimed. But in no case should the decision of an arbitration be permitted to bar either party from further appeal to the courts, according to due process of law. It is not only legally impossible to take that right away from a citizen, without a radical change in State and Federal constitutions; it would be also the highest folly and the foulest crime against justice. There is no question here of wrong to one party, more than the other. Yet if either were more generally wronged in practice by such a crazy and criminal reversal of the methods of justice, it would doubtless be, in the long run, the workman, who would find himself without remedy, after the first defeat at the hands of a more powerful opponent.

But it is clear that the employer would not appeal a case involving only the comparatively small forfeit of a single workman. The cost of the proceeding would exceed the amount involved. And the workman might not have the means to prosecute an appeal, though there might be for him, under the provisions of the agreement, the prospect of recovering a sum twice or three times as large. In that case the power of the labor-organization comes legitimately into play. And this brings me to a point which may have suggested itself already to the reader. Namely, if contracts with individuals are to be recommended in the relations of the organized trades, as in all other social relations, what room is left for the labor organizations? Do they not at once fall as superfluous machinery?

One important function for the labor organization is indicated above. Even if the contract of employment be made with each workman as an individual, it may be important that he should be supported in any contest with superior wealth and power, in which he is deserving of such support. It might be extremely useful to include in the individual contract a reference of every case to the organized labor of the works, before even an arbitration.

But there are other useful activities within the sphere of such bodies (including not only the organizations limited to a given works, but also those of wider membership) which will be indicated in a subsequent article on "Labor and Organization."

R. W. R.

#### NEW PUBLICATIONS.

THE MINING LAWS OF THE REPUBLIC OF COLOMBIA. With a Short Explanation of Their Application and Official Forms for Notices, Denouncements and Applications for Title. Translated and Edited by Charles Bullman, M. E. Cloth 8vo, 107 pages. Published by the Scientific Publishing Company. New York, 1892. Price, \$1.50.

The publishers have shown commendable enterprise and foresight in issuing the first translation of the mining laws of the Republic of Colombia.

This publication is most opportune and will do much to draw the attention of capitalists to that country. We can see that the translator has desired to do justice to it, and that his has been a task of love. The book is a handsome octavo volume of 107 pages, bound in cloth, and is fittingly dedicated to Dr. Rafael Nufiez, the President of Colombia. In addition to the mining laws proper there is given a concise but comprehensive explanation of their application and—a most important feature—the official forms for notices, denouncements and applications for title. The translator, Mr. Charles Bullman, M. E., is exceptionally well qualified for his work. He has had considerable experience in mining operations in Colombia, both in the field and law courts, and he has had the benefit of the assistance of several able lawyers. "The present mining laws of the Republic of Colombia," says Mr. Bullman in his interesting introduction, "had their origin in the old Spanish mining laws which formed part of the *Ordenanzas de Castilla*, which were in force more than 300 years ago.

"In 1857 Granada adopted a Federal constitution and the Province of Antioquia became a state of the same name. The legislature of this State, on October 3d, 1864, passed a law, known as *Ley 38*, which repealed all existing mining laws. But the provisions of this law were quickly found to be very unsatisfactory, and almost immediately after its passage the State Legislature began to study the provisions of a new and more complete law on the subject; a law which would encourage mining, and which, while interesting and affording protection to capital invested in the mining industry, would at the same time provide that the mining lands granted by the State in fee simple, should yield a revenue to it. The result of their labors was *Ley 127*, passed October 21st, 1867, and known as the *Código de Minas de Antioquia*. This law forms the nucleus of the present mining law of the Republic of Colombia.

The mining laws of Colombia are liberal and, judicially, almost perfect. It would not be amiss for our legislators to read carefully the Colombian mining laws; and the student of other countries will find much to instruct him in this volume. To mining engineers and to all those who go to Colombia in pursuit of their profession, we certainly recommend Mr. Bullman's translation. We do not hesitate to pronounce it an indispensable work to the engineer, a *vade mecum* without which no foreign miner in Colombia can afford to be, for even though he be ignorant of the Spanish language he will be able to conduct all legal business with the assistance of this book. In its careful and painstaking execution the work reflects great credit on the translator and editor, and, typographically, it is excellent, as have been heretofore all the publications of the Scientific Publishing Company. We venture to predict a ready sale for it among that portion of the public, capitalists and engineers, in any way interested in mining enterprises in South America.

Deep Mining in Sandhurst, Victoria.—Deep mining in this district is proving singularly successful, and explorations are being actively pushed at depths of from 2,000 to 2,800 ft. Taking the district as a whole, this is probably the deepest gold mining in the world.

## 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 Kittson-Browne Process.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I read with interest your articles about the McArthur-Forrest Process for ores. Now can you favor us with some information pro or con regarding the Kittson-Browne Process, of Boston? I am yours truly,  
SOUTHPORT, Conn., Aug. 30, 1892. ROBT. P. WAKEMAN.

[We know nothing of the "Kittson-Browne process". It can scarcely have attained much success or the facts would have been sent us.—ED. E. & M. J.]

## The Michipicoten Copper Mines.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of August 6th appeared an article on Michipicoten Island and its copper mines, for which I furnished much of the information; still I do not desire to be credited with the article in its entirety, as it might misrepresent my own views on the subject. I think that some portions of my information not published might be interesting here; they are taken principally from a report made by C. Robb in 1880:

The lodes or beds known all crop out on or near the shore, no attempt having been made to find any further inland. They run N. 35° E. and dip S. W. toward and into the island at an angle of from 40° to 50°. The outcrops of the two lower beds are under the lake. Lodes Nos. 1 and 2 are amygdaloid from 8 to 12 ft. wide. No. 3 is a conglomerate 30 ft. wide. No. 4, about a mile west, is a conglomerate 8 to 12 ft. wide with a hanging wall of amygdaloid and a foot wall of sandstone. It runs in a slightly different course from the others and can be readily traced for two miles. No. 1 Lode.—The "office" shaft is sunk on this lode and consists of a greenish gray and purple amygdaloid trap 6 or 8 in. thick, containing native copper in coarse grains and small masses generally embedded in calc spar. This band I should estimate to contain on an average 10% of copper. Underlying this is a band of purple sandstone streaked with gray (lime) averaging 2 ft. 6 in., thickly impregnated with copper in minute threads or grains. The proportion of the metal in this bed will be about 2%. It is remarkable that the copper is concentrated chiefly in the calcareous portions of the rock. Succeeding this is a soft argillaceous bed for 5 ft. also containing copper in particles and occasionally in lumps. This may be estimated to contain 1% of copper, and though much of it is barren rock, still it is very soft. About one-third of a mile distant the Bevan shaft has been sunk to a depth of 95 ft. with an adit of 140 ft. in length, about the level of the lake. A level has also been driven to the east 60 ft. In these the metalliferous character has been fully maintained, some large masses having been met with.

NEW YORK, Aug. 31, 1892.

HERMAN POOLE.

## The Tuscarora Mines, Nevada

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: My letter of the 16th ult. referring to the existing lack of confidence on behalf of the outside and assessable stockholders in the management of these properties, elicited reply and important information tending to confirm the opinion that these properties are dishonestly managed and regardless of interests of said stockholders. There is sufficient reason for believing that the same condition of management and the same dirty tricks are practiced at Tuscarora as are known to exist on the Comestock. Now if the stockholders are desirous of protecting themselves and putting a stop to the shameful, thievish mismanagement of their properties there is but one thing to do, viz.: unite and contribute a stated and sufficient fighting fund with which to employ suitable agents at the mines and elsewhere who will prosecute an exhaustive investigation. I am informed by gentlemen of experience in these matters that by pursuing the course herein indicated, in a businesslike way and with a sufficiency of means, the necessary evidence for the conviction of the "Tuscarora Ring" can be obtained and an accounting brought about that would repay the stockholders handsomely.

To those interested I earnestly invite immediate co-operation. For my part I will support my interest in the matter to the extent of four times the present market value, and will willingly give such time as I have at my disposal toward forwarding the work, without fee or reward.

I would urge all who are in any way interested to make early effort to work up an interest by any and all legitimate means and induce stockholders of the Tuscarora companies to unite.

FORT PORTER, Buffalo, N. Y., Sept. 1, 1892. THOMAS F. CHUCK, Stockholder.

## RECIPROCITY AND OUR SOUTH AMERICAN TRADE.

Written for the Engineering and Mining Journal by Charles Bullman M. E.

Has reciprocity benefited our trade relations with the South American Republic?

If this question be asked of an exponent of one political party, the answer will be that the total value of our trade with the countries with which we have reciprocity treaties, during the period for which these treaties have been in force, is \$267,795,422, as compared with \$190,379,678 for the corresponding preceding period, an increase of \$77,415,744.

No sooner have we received this answer than we hear from the opposite party that the increase in trade has been most largely due to our greatly increased imports of coffee and sugar, and that the balance of trade against us has increased, for the periods named, from \$121,986,980 to \$183,138,066. The same person will state that with Porto Rico and British West Indies and British Guiana our trade has fallen off nearly one million dollars.

Both of these replies are true and yet neither gives the whole truth. Figures given in gross tell nothing, in fact, they most generally are misleading.

The chief benefits of reciprocity are to be measured by our exports, and especially by the exports of materials directly affected by it.

Our imports from Brazil and Cuba have increased \$67,671,170 since the reciprocity treaties became law, but it can hardly be claimed that this is the result of reciprocity. The McKinley Bill removed the duties from sugar, coffee, and hides, and their greater cheapness has simply given them an extended use in this country, just as would a reduction of duties and other charges lessen the cost and increase the consumption of these and other articles. Our imports of sugar, coffee and hides from Venezuela have increased also, yet we have no com-

mercial treaty with that country. Increased cheapness extends use and causes an increased demand.

Brazil, with which we have had a commercial treaty since March 31st, 1891, now admits cereals and various food products, agricultural tools, mining machinery, tools, and railway construction material free of duty, whereas before the treaty went into effect these various articles paid duties ranging from 5 to 48 per cent., and these articles still pay such duties when imported into Brazil from countries other than the United States. Certain other articles, such as lard, canned meats, cotton manufactures, iron and steel manufactures, not otherwise provided for, lumber and wood manufactures, are now admitted into Brazil with a reduction of duty of 25 per cent. Our total exports to Brazil for the 15 months ending June 30th were valued at \$18,044,452, as compared with \$16,279,969 for the preceding period road cars, \$439,675; iron and steel manufactures, \$1,544,959, the most of like duration. Our exports of flour increased \$1,745,459; steam rail- important item of which was an increase of \$1,028,989 in the value of steam engines, and lumber and wood manufactures, \$155,933; all of which articles are directly affected by the new tariff arrangement.

On the other hand we find that our exports of wheat have fallen off to the extent of \$779,897; our exports of lard, \$1,450,947, both of which articles are favorably affected by the reciprocity treaty. If this great decrease can not be satisfactorily explained it would seem to show that reciprocity had but little effect upon our trade, or that if it acted favorably in one case, it was unfavorable in another. But upon investigation we find that in 1891 the Argentine Republic had a very large output of wheat, and that owing to its proximity to Brazil it was enabled to sell its wheat there at a less price than the United States could do it, notwithstanding a differential tariff in our favor of 5 per cent. As regards lard we find that our exports to Brazil during 1890 and 1891 were largely in excess of those of previous years on account of the failure of the corn crop of those years.

We have seen a similar case in the Republic of Colombia, where owing to a failure in the corn crop of one Province the country not only suffered for the lack of corn, but also for pork and lard, into which they were accustomed to transform their surplus of corn.

In the face of these figures it would be idle to deny that reciprocity has benefited our trade with that country, and the same line of investigation pursued with regard to other countries with which we have partial free trade will show a like condition of affairs, and the benefit to us appears to be greater in proportion, as reciprocity covers more articles of commerce. This is shown by an increase of exportations to such countries of \$8,132,329 during the time such treaties have been in force over a like preceding period.

The fact remains, however, that while our exports have increased \$8,132,329, our imports have increased \$77,415,744. It is, indeed, self-evident that we can only export in any quantities to countries from which we import. Trade must be mutual, and where we buy there will we sell. Before the McKinley bill was signed, its main provisions were known throughout the extent of our country, consequently the moment the duty was removed from sugar and coffee, the demands upon the countries producing them increased by leaps and bounds.

On the other hand, South American countries have but limited means of inland communication, and it is no exaggeration to say that there are thousands there who do not yet know of reciprocity; who do not know that certain classes of goods can now be obtained cheaper from the United States than from other countries.

Again, South American merchants have for years traded with European merchants. Finally many South American merchants know nothing of our goods other than flour and kerosene. If our merchants wish to secure this trade they must diligently pursue the proper means to make their goods known. Reciprocity has extended our field of operations, but unless it be carefully cultivated, it will benefit us but little. In endeavoring to get this trade, it is of prime importance to know its needs and desires, and the local conditions which govern the demand. English, German and French merchants have for years studied these factors. If to-day they do a large business it is because they know the requirements of the different Republics, and are careful to comply with them; they have made known their merchandise by advertisement and by sending their agents to South America; they have studied the tastes of the people and give them what they want, at the same time educating them to better things; they have established banking facilities and are willing to give long lines of credit; in short they have conformed to the local conditions governing trade in the South American Republics.

It is safe to say that reciprocity alone, or the mere fact that a mutually advantageous commercial treaty exists between some of those nations and ourselves, will not be sufficient to wrest from European countries the trade that they have for so many years enjoyed. Our merchants must pursue the tactics practiced by our rivals; they must advertise in papers and journals having a circulation in those countries; they must send their agents out to become acquainted with the merchants with whom they wish to trade, and to study the conditions under which trade is conducted. They must establish banks and be willing to give long lines of credit.

When they have found out what South America wants, they must send that and not something else, which they may think will do as well or better. If the goods are for the inland trade and must be in packages of 150 lbs., it won't do to put in 160 lbs. unless it be absolutely unavoidable, for the extra 10 lbs. may double the inland freight. If an order is for machinery, all easily breaking parts should be sent in duplicate, with clear instructions on the use of each part. If an agent finds out that a special want can only be satisfied by a special machine, it is better to make it than to waste time trying to persuade the buyers that something else will do as well. Don't send flour in sacks, don't send heavy pieces of machinery when it is possible to divide the weight, don't send shoddy or job-lot goods of any kind, such as paper soled shoes to a wet country, and above all when the customer has been somewhat tardy in making payment, don't believe he is trying to cheat, and don't write a very sharp letter. The chances are that he is perfectly honest and will pay as soon as he gets the money from his customers in the far interior.



SYDNEY COAL MINES, CAPE BRETON.

The Sydney coal field, Cape Breton, the most extensive in Nova Scotia, has an area of 200 square miles. It extends from Mira Bay on the east to Cape Dauphin on the west; on the south it is bounded by the Millstone Grit, and on the northeast it dips under the sea; in fact the main body lies under the ocean. The total thickness of the coal measures is stated to be 7,000 ft. A natural section three miles long, measuring 1,860 ft. thick, can be seen on the north side of Sydney Harbor. Mr. Robt. Robertson, Jr., in a paper read before the Mining Institute of Scotland, states that 34 seams of coal can be counted in this section; of this number, however, but few are workable.

The Sydney mines district occupies an area of about 10 sq. miles, the principal seam in the district being known as the Six-foot, or Sydney Main seam.

The first operations on this Main seam were commenced in 1875, on Government account. From 1785 to 1826 the mines were leased to six individuals or companies, and on Jan. 1, 1827, the mines came into the possession of the present owners, the General Mining Association.

In 1830, a shaft 200 ft. deep was sunk, which continued to supply the trade until 1834 when another shaft, 320 ft. deep was sunk, 400 yards further to the dip. This shaft continued in operation until 1854, when it was destroyed by a heavy influx of water, which overpowered the pumping engine. In the meantime, a new shaft had been sunk and equipped in anticipation of such a disaster, and was brought into operation. This shaft is 400 ft. in depth, and now forms the upcast shaft for the present workings. This shaft is known as the Queen Pit.

In 1865 a lease of five sq. miles, of submarine area, was obtained. The sinking of the present shafts was commenced in 1868. These shafts are situated near the shore, at the northwest entrance to Sydney Harbor. They are placed 22 yards apart, one is 13 and the

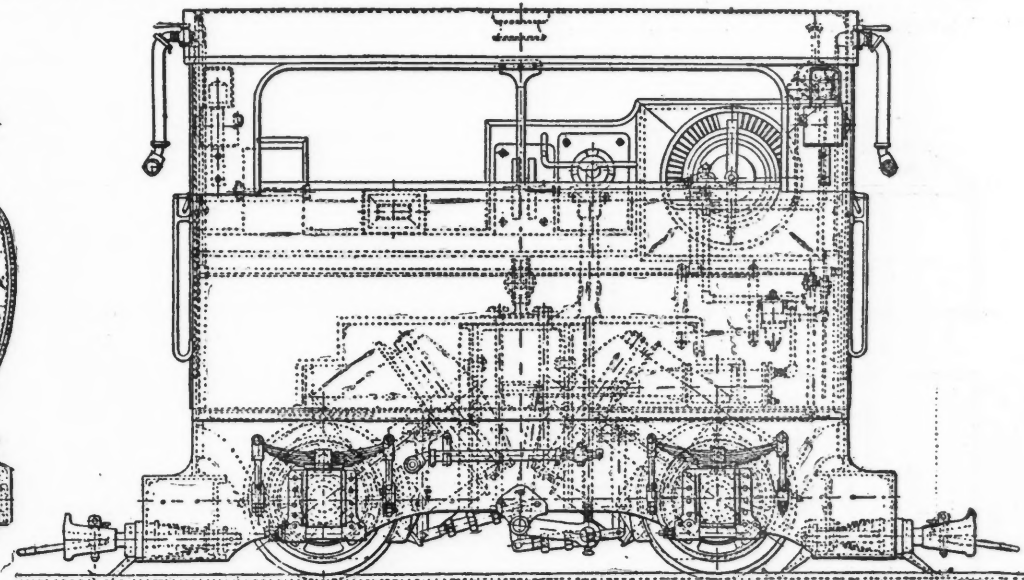
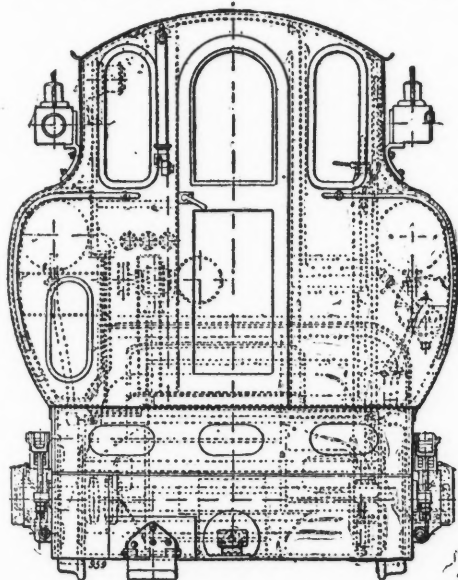
The coal is shipped at North Sydney, four miles from the pit. The greater part is sent up the St. Lawrence to Montreal, Quebec.

A LARGE ENGLISH ELECTRIC LOCOMOTIVE.

The largest electric locomotives yet made are those recently supplied by Siemens Brothers & Co. to the City & South London Electric Railway, England. They are described in a paper read by Mr. Alexander Siemens at the last meeting of the British Association. We extract the following information from this paper, and we reproduce the accompanying illustrations from London "Engineering."

In 1888 the railway company asked for bids for electric locomotives capable of developing a maximum brake horse power of 100, and Messrs. Siemens then tendered the present designs. Owing to a desire for economy the company did not accept it then, but adopted a smaller motor of the Edison-Hopkinson type. At the beginning of last year they renewed negotiations with Messrs. Siemens and ordered two locomotives of practically the same design as that in the original tender. These are now working with excellent results.

Each locomotive is constructed to develop 100 brake horse power at a speed of 25 miles an hour. There are two motors to each locomotive. The armatures are built directly on the wheel axles, and thus the use of gearing is obviated. The armatures are coupled in series. The electromagnets are suspended at the yoke end from a girder built into the locomotive frame, and the pole pieces are carried by gun-metal brackets and bearings resting upon the axle. Inside the cab is the controlling gear, which consists of the following parts: A main switch for stopping, starting and regulating the current, a reversing switch, a plug commutator for the connections to the magnet bobbins, a main cut-out and a main switch, an ammeter and tachometer. The side frames, the floor-plate and the cab are all of steel; the wheels are of cast iron with steel tires and axles; the hornplates are of steel



A LARGE ENGLISH ELECTRIC LOCOMOTIVE.

other 11 ft. diameter, and are 670 ft. deep, and known by the name of Princess Pit. In the course of sinking, heavy feeders of water were met with at a depth of 300 ft., which were successfully tubed off with cast-iron tubing, both shafts being lined to a depth of 300 ft. The larger shaft is used for winding, and the smaller one contains the pumps, and is used for lowering and raising the men. The winding engine is of 160 H.P., and is capable of raising 1,000 tons of coal per day of ten hours. The engine raises two tubs at a time, standing end to end in the cage. Each tub carries 14 cwt. of coal. The winding ropes are of steel, 4 1/4 ins. in circumference.

The system of mining is a modification of the stoop-and-room method, but none of the pillars are being taken out. The main levels and deeps are driven in pairs, 8 ft. wide and 10 yds. apart. The rooms are 16 1/2 ft. wide, and are carried parallel to the levels. At intervals of 70 to 80 yds. single deeps and headways are set off as they advance, and are again broken off as the deeps and headways win them. Midway between these deeps and headways, cross-cuts are driven between the rooms, almost invariably downhill from the higher to the lower room. These single deeps, headways, and cross-cuts are driven 9 ft. wide, and the pillars are 12 yds. thick on the square. The rooms are broken off 12 ft. wide and put through at the same width.

The ventilation of the workings is effected by means of a Guibal fan placed at the top of the Queen Pit. The fan is 30 ft. diameter by 10 ft. wide, and at 40 revolutions per minute circulates 80,000 cu. ft. of air, with a water gauge of 1 3/8 ins.

A large Cornish engine drains the mine. The cylinder is 62 ins. diameter, with a stroke of 9 ft., and the water is raised by two bucket lifts, each 20 ins. diameter. Eight hours' pumping is usually sufficient to keep down the water. There is also a large pumping engine at the bottom of the Queen Pit, which forces the water to the surface in a column. This engine is direct acting, with large flywheels, cylinder 24 ins. diameter and 4 ft. stroke, plungers 10 ins. diameter.

An engine of the same type with 36-inch cylinder is being erected at the bottom of the Princess Pit to force the water to the surface in one lift to supersede the Cornish engine.

The pit bank, screens, and engine houses are lighted by electricity, and electric signals are in operation under ground on the engine planes

riveted to the side frames. The chief dimensions are: Length, 14 ft.; width, 6 ft. 3 ins.; height from rails, 8 ft. 5 1/2 ins.; gauge, 4 ft. 8 1/2 ins. Total weight, 13 1/2 tons. The locomotive runs on two pairs of wheels having a wheel-base of 6 ft., and the wheels are 2 ft. 3 ins. in diameter. It is fitted, in addition to a hand brake, with a Westinghouse brake; the air reservoir, which serves for the carriage brakes as well, has a capacity of 17 cu. ft., which is sufficient for one up and down journey. The current is collected from the conductor, which is in the form of a central rail, by a sliding contact shoe fitted at each end of the locomotive.

When hauling a train an average speed, excluding stops, of 13-25 miles an hour is obtained by a current of 50 1/3 amperes at 424 1/6 volts.

The motors for the two locomotives were tested by means of a Prony brake before they were fitted into their places, and some of the results of these tests are given in the following:

Speed in miles per hour.	Electrical horse power put into motor armature.	Electrical horse power put into motor magnets.	Total electrical horse power per motor.	Total electrical horse power per locomotive.	Brake horse power measured.	Efficiency, per cent.
12.25	56.96	2.8	59.76	119.52	110	92
14.77	24.42	1.21	25.63	51.26	47.1	91.87
15.7	21.5	0.86	22.36	44.72	40.02	89.89
17.83	21.85	0.74	22.59	45.18	42.62	94.32
22.73	29.23	0.35	29.58	59.16	54.3	91.79
24.7	19.5	0.2	19.7	39.4	36.6	92.68
30.6	26.27	0.17	26.44	52.88	48.76	92.19

After the locomotives had run about 8,000 statute miles, the brushes were wearing at the rate of about an eighth of an inch per thousand miles run. The smallness of this wear is in consequence of the motors running sparkless and practically without heating.

These locomotives are more powerful than the others used on the same line, and are capable of greater speed with similar loads. However, as the trains run so close together these locomotives are obliged to conform to the lower speed of the others. Consequently the results obtained by them are not indicative of their maximum powers.

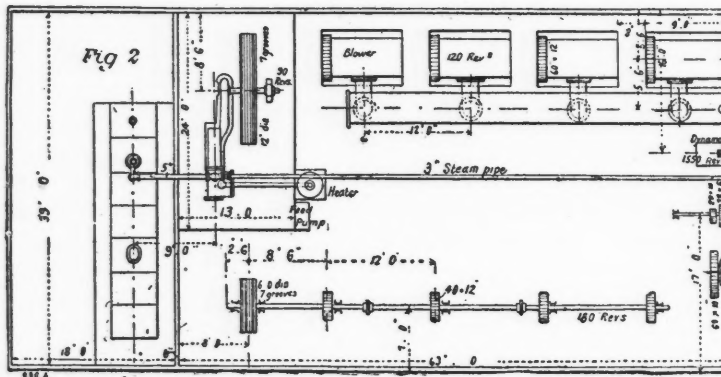
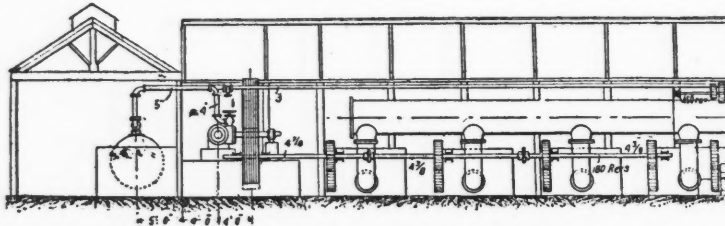
## THE ZEEHAN AND DUNDAS SILVER SMELTING WORKS, TASMANIA.\*

We herewith give an illustrated description of the plant at the smelting works at the silver fields of Zeehan and Dundas, which are located on the west side of Tasmania, 30 miles from the port of Strahan, and on the Zeehan, Dundas & Strahan railroad.

The site chosen for the works is on a sloping hillside, and they are laid out in such a manner as to minimize the labor in handling the ore. The ore is received on a covered platform, 25 ft. by 80 ft.; it is here sampled and weighed into barrows, and then wheeled directly over the ore beds and dumped onto them, and spread in layers. There are four beds, 14 ft. deep, 20 ft. wide and 60 ft. long, holding about 1,000 tons each. In front of the bins lie the fuel and flux bins, which are of sufficient size to contain 48 hours' supply. The main smelter building is a two-story structure, 80 ft. long by 32 ft. wide, with a feed floor 20 ft. above the ground floor. In this building there are two water-jacket furnaces of an improved type, measuring internally 11 ft. 4 in. by 3 ft. 4 in. at the tuyeres. The lower part of each furnace is as usual made of wrought iron plate, lined with fire-brick, forming the crucible and lead well. Upon this rest 22 cast-iron water-jackets, each 17 in. wide and 42 in. high, and above these again is the wrought-iron superstructure, which reaches to the feed floor.

The hood of this furnace is entirely separate from it and is not required to support the usual brick superstructure. The bottom cast iron jackets are fixed in place by means of a bracket which rests against the girder and carries a screw which bears directly against the overflow lip of the jacket. By this improvement each jacket is held firmly in place independently of the others and in case of fracture any one can be taken out and without disturbing the others. It also does away with the cumbersome binders sometimes used. The furnace is surrounded with the usual air pipes, water pipes and overflow troughs. The hollow columns supporting the girders and superstructure are used as off-takes for the overflow water of the jackets. On the feed floor the mouth of the furnace is surmounted by iron floor plates. Resting on these is the hood and flue for carrying off the fume and smoke. This hood is separable. The lower half contains the feed doors and rests on rollers so that it can be

Fig. 1



THE ZEEHAN AND DUNDAS SMELTING PLANT.—PLAN AND ELEVATION.

pushed aside if there is any occasion to bar the furnace. The upper half carries a short stack leading through the roof, and is surmounted by a damper and a flue leading to a dust chamber. On account of the very high price of even poor brick in this locality, the hood, flue, dust chamber, and stack are all made of wrought iron.

The blast for each furnace is supplied by a No. 6 Baker blower. The water required for the jacket is furnished by an Otis duplex pump which forces it 1,170 ft., with an elevation of 72 ft. to a 14 ft. by 20 ft. wrought iron tank on the side of the hill.

These works were running on April 1st last, and there is room for two more furnaces when the demand requires it. The supplies of ironstone, limestone and wood are good, abundant and reasonably cheap. Coke is dear, costing about \$21 a ton at the works. The ores, generally speaking, are exceptionally good smelting ores. The plant has been made by the Austral-Otis Engineering Works of Melbourne, from the design of the Smelting Company's general manager and metallurgist, Mr. G. F. Beardsley.

**Discovery of Potassium Salts at Sondershausen, Prussia.**—It is reported that borings have demonstrated the existence of extensive beds of potassium salts in the Wipper Valley, Prussia. At Stassfurt the potassium industry has been developing since 1857, and in 1887 there were seven mining works, which mined about 650,000 tons. The money necessary for carrying out the work has been estimated at \$2,000,000. In addition to the taxes and other charges the State will claim 15 per cent. of the net profits. The State also reserves to itself the right to take up one quarter of the undertaking on its own account.

\*From London "Engineering."

## VARIATIONS IN THE MILLING OF GOLD ORES—I.

Written for the Engineering and Mining Journal by T. A. Rickard, A. E. S. M., F. G. S.

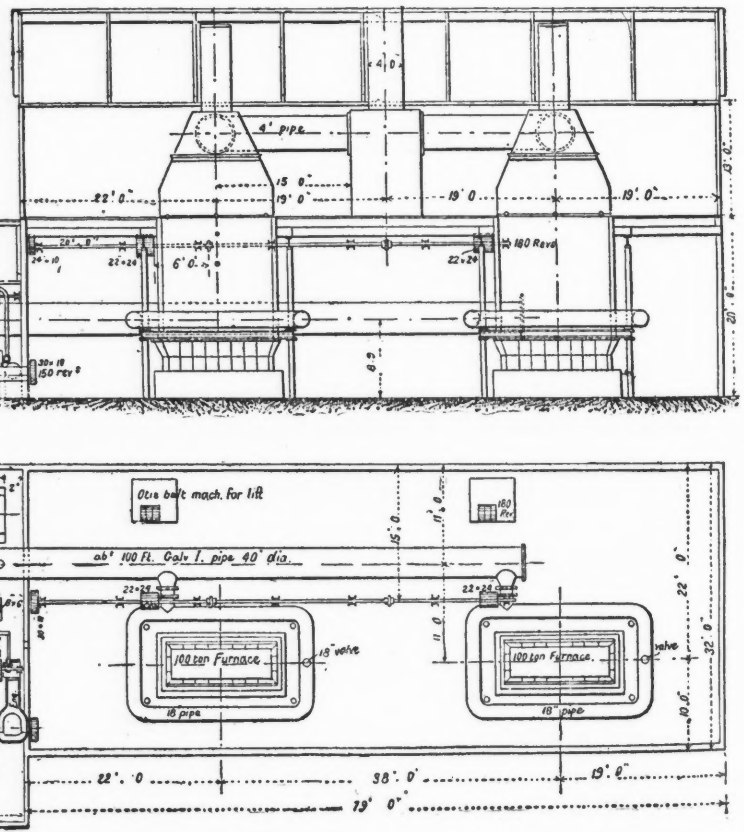
GILPIN COUNTY, COLORADO.

(Continued from page 199.)

The blanket strakes, or "blanket strips," are 3 feet long and 18 inches wide. They are washed three times per day or every four hours, an interval which with rich ore is decreased sometimes to two hours. They serve to arrest any escaping amalgam or mercury, as well as "rusty" gold and the heaviest pyrites, together with particles of ore to which gold is still attached. They may be perhaps needed to save the last mentioned class of material, but for the rest the millman is probably correct in his belief that they could be discarded without any loss, since this work is done by the concentrating machines.

From the blankets the pulp passes to the concentrators, which are shaking tables, called in the locality, where they are also constructed, "bumpers." They are the outcome of Gilpin County practice and are a variation of the Rittinger type; see illustration. In the Hidden Treasure mill there are five of these, each subdivided into two parts. The new model is of a lighter pattern than the old, which was divided into three partitions. The speed is regulated according to the percentage of pyrites in the ore, but will average at the rate of 130 strokes per minute.

Of the total amalgam obtained two-thirds is the yield of the plates inside the mortar box, the amount being fairly divided between the two. On cleaning up, the sand found in the battery around the dies is not



panned but returned to the mortar on restarting. The outer amalgamating tables are cleaned up every 24 hours, but the inside plates only every 48 hours. With poor ore the last mentioned period is further prolonged.

At the general clean up the amalgam as it comes from the plates is placed in a mortar to be ground with the addition of hot water until of even consistency. The now dirty water is decanted and mercury is added until the amalgam is thin. The thin flowing amalgam (or, rather, mercury, which has absorbed the amalgam) is decanted from one porcelain dish to another several times. As the pyrites, dirt, etc., rise to the surface they are skimmed off by the operator's hand. The clean amalgam which finally remains is then squeezed through canvas. The skimmings obtained are re-introduced into a mortar and treated separately, being ground with the addition of hot water and fresh mercury. When fairly clean a bit or two of potassium cyanide is added to render the mercury more active by the decomposition of the oxides injurious to it.

In retorting the interior of the iron retort is either chalked or lined with thin paper. The latter method is to be preferred. The balls of dry squeezed amalgam are put into the retort, broken with an iron rod, and then pressed down until hard and uniform. A good-sized bolt with a nut at the end is a good tool for this purpose. The cover is then put on and luted down with clay.

The only chemical used in the mill is potassium cyanide. Of this 26 cans of 10 lbs. each were used in a year, during which time 28,793 tons of ore were crushed. The tables are dressed every 12 hours with a weak solu-

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† It is found, therefore, that the direct saving of the gold (the saving in the blanketings and concentrates is indirect) is evenly divided between the three amalgamating appliances—the front inside battery plate, the back inside plate, and the outside table.



tion of 2 oz. KCy in three gallons of water. The tendency in Gilpin County, as in California, is to diminish the use of nostrums in the gold mills.\*

The tables are brushed twice per day with a mop, mercury being added if the amalgam is found to be too hard—that is, too dry.

The ore is delivered by a steam tramway and discharged into ore bins. There are no rockbreakers. The feeding is done by hand. There is one feeder for every 25 stamps, the pay being \$3 per shift. The power for driving the machinery is derived from water and steam. There is an overshoot water wheel of 50 feet diameter and 4½ feet breast. For four months the water power suffices, for four months (in the severe winter) the mill is worked entirely by steam power, and for the remaining four months the two motive powers are combined. Firewood costs \$4.75 per cord, delivered. The cost of milling in 1890 was at the rate of 84 cents, but in 1891 it was decreased to 78 cents per ton of ore crushed.

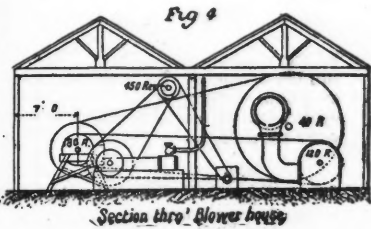
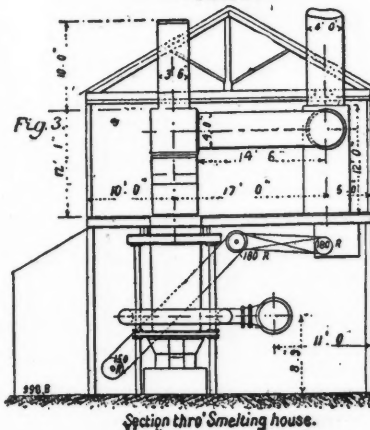
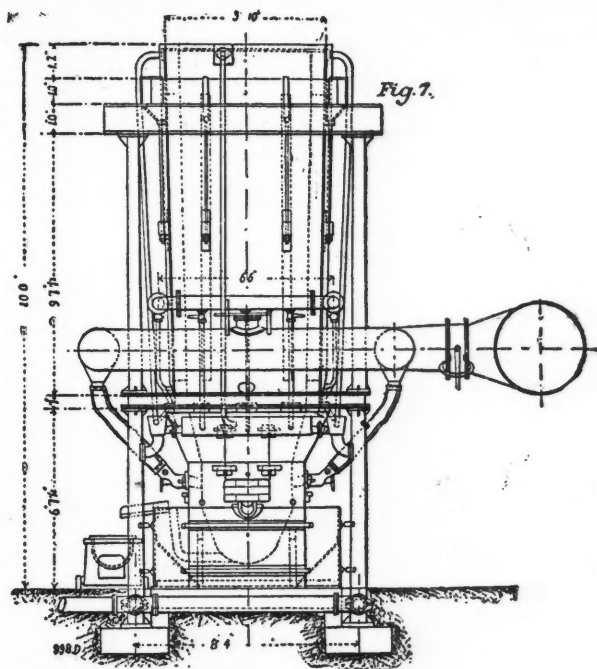
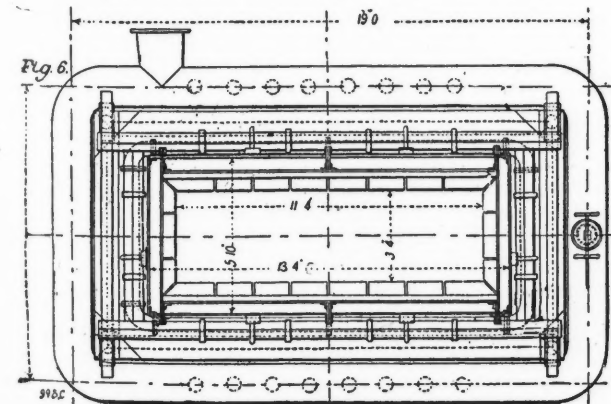
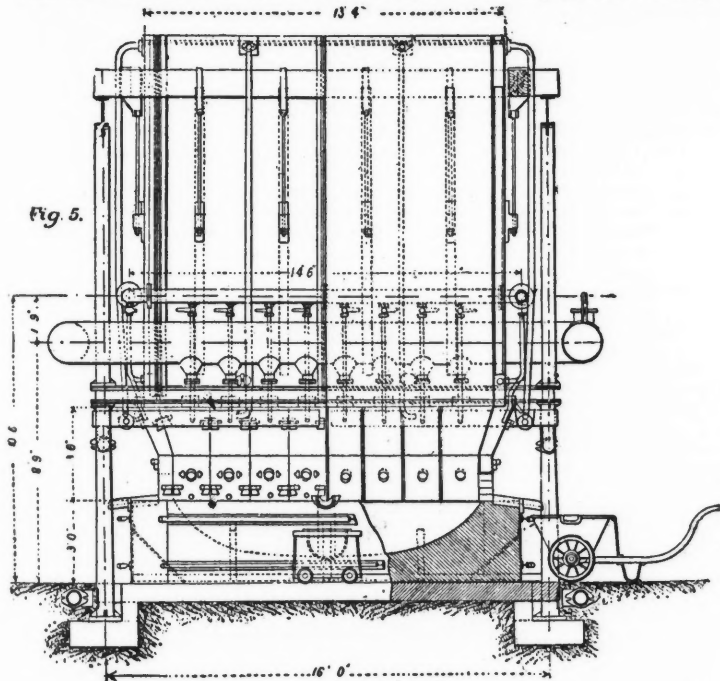
The labor employed is thus distributed: The figures are per month of 30 working days, 75 heads: 1 millman, \$175; 1 assistant, \$100; 6 feeders (3 per shift) at \$3 per day, \$90 per month, \$540; 2 concentrator men (1 per shift) at \$3 per day, \$180; total, \$995, or 38 cents per ton. The day of 24 hours is divided into 2 shifts.

In looking down the columns of the comparative table it will be seen that while the mills are all of the same type, and are engaged in crushing

deeper mortar, while that of the Gregory Bobtail fairly indicates the construction of the more recent plants.

The crushing capacity of the mills varies from slightly over to a little under one ton per stamp per 24 hours. Such variation as exists is due to the differences in weight of stamp, height of drop, depth of discharge, speed of drop and fineness of screen. The Prize has the least crushing power per stamp, since it has a comparatively short drop, a deep discharge and a weight of stamp which is slightly under the average. The deep discharge affects the crushing capacity of the Randolph. The slow drop of the New York is largely made up by the heavier stamps and the increased length of the drop. The different features mentioned are well balanced in the case of the Hidden Treasure, and it has, therefore, a crushing power slightly above the average.

The percentage of concentrates obtained ranges from 12 to 20% and forcibly indicates the refractory character of the mill stuff. The value per ton of these concentrates is very low, averaging 10 to 12 dollars net, and they are only rendered a profitable item by successful and cheap concentration supplemented by light charges at the smelter. Neither the concentrates or the blanketing undergo further treatment at the mills. They are shipped on railway cars which are conveniently switched at the mill door and are sent to the various smelting establishments at Denver.



THE ZEEHAN AND DUNDAS SMELTING PLANT.—SECTIONS OF FURNACE.

ore of a generally similar character, there are yet certain differences which it will be interesting to inquire into. The stamps are all of comparatively light weight, varying from 500 to 600 lbs. This is rendered necessary by this particular style of milling where the high drop would be impracticable with stamps of 850 and 900 lbs., the average of other districts. The speed also is directly affected by the same cause, for the work required to lift the stamps from 16 to 18 inches prevents the rate of drop exceeding 32 per minute for good work. A speed of 40 is probably the practical limit.

The slowest drop is that of the New York mill—26 per minute—and the fastest is that of the Hidden Treasure—32 per minute. The latter represents the tendencies of the milling practice of to-day, while the former has in this respect adhered to older modes. It is to be noted in addition that the New York mill has the longest drop; in this respect, also, it follows the older practice, for the tendency to-day is certainly not in the direction of an increase of drop. The issue or depth of discharge ranges from a minimum of 11 inches at the Gregory Bobtail to a maximum of 16 at the Prize and Randolph mills. The 16-inch issue represents the older,

The freight is now \$1.50 per ton. Ninety-five per cent of the silver and gold contents as determined by assay is paid and \$8 per ton is deducted as smelting charges. At one time, when this class of material was less plentiful than now, a minimum rate of \$7.25 was allowed.

The retort percentage is seen to average from 33 to 40; it depends upon the richness of the ore, since the gold in rich ore is coarser than that of the poor stuff, and hence is less perfectly amalgamated.\* It is comparatively high for an ore the character of which is more fairly indicated by the fineness of the gold, which is comparatively low grade, varying from 700 to 850 per thousand. The amount of water used in the mill varies from 1½ to 2½ gallons per minute per stamp, and is, considering the deep discharge in vogue, comparatively low, owing to the small capacity of the mills and the slight use made of blankets, together with the very high slope of the amalgamating tables, viz., from 1½ to 2½ inches per foot.

In the matter of the wear of the screens and the loss of quicksilver, the divergencies are so considerable as to merit careful examination.

The screens used in this district are of local manufacture and are made of planished iron, † size No. 24. The openings are straight, horizontal

\* The danger of the use of chemicals arises from the very imperfect knowledge which the millman usually has as to the reactions induced. In the above case, for instance, we know KCy to be a solvent of gold, and it can therefore readily be seen how very careful should be the use made of it.

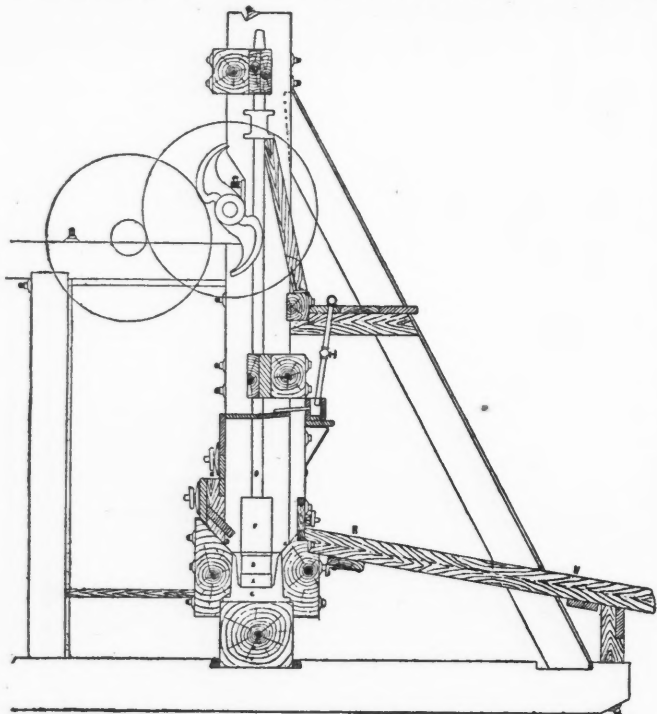
† In squeezing the amalgam the millman can cause a variation of 10% in the quantity of gold obtained in retorting, according to the thoroughness with which he squeezes through the canvas the excess of mercury in the amalgam.

‡ An American imitation of Russia iron.

slots arranged alternately. The screens are graded according to the size of the openings, from 1, the finest, to 1½, 2, 2½, etc. Numbers 1, 1½ and 2 are those generally in use, and they are conceded to be equal to 60, 50 and 40 wire mesh respectively. It is to be noted, however, that this type of screen has nothing like the discharge surface of the supposed equivalent in wire mesh. This is seen in practice where, in this district for instance, a large proportion of the pulp is kept inside the battery until crushed to a size which would allow it to pass a 100-mesh wire screen. While these screens are by no means to be recommended for other districts, they are well adapted to the carrying out of the main idea underlying Gilpin County milling, namely, the retention of the pulp inside the mortar box for a long interval so as to allow of its amalgamation there.

The side which carries the burr edge of the punched openings of the screen is always placed facing the inside of the mortar box for the evident reason that the burr helps to break the pulp and so prevents the choking of the slots. It is the general custom of the mills to invert the screen after a time since the passage of the pulp wears the lower portion faster than the upper. The screen is never reversed, that is, the original burr side placed facing outward.

The life of the screen, the time it is used, in the different mills is seen to vary from a minimum of 16 days to a maximum of 81, from two weeks to about three months. This very wide difference is far greater than can be explained by the greater or less attention of the millman and the extent to which he is willing to allow the screen openings to be enlarged by wear. The mills whose names appear in the comparative table are all situated at Black Hawk and are all erected



The accompanying drawing, which the writer owes to Messrs. McFarlane, of Central City, illustrates the arrangement of the parts of the battery. A is the die; B, shoe; C, mortar; F, boss; G, stem; H, amalgamating table; while D and K indicate the position reserved respectively for the back and front inside amalgamating plates.

SECTION OF A GILPIN COUNTY STAMP BATTERY.

by the side of the creek which flows down the cañon and under the muddy streets of the dirty old town. Put them in their order of succession commencing with the Hidden Treasure, which is farthest up the creek, and an explanation of the widely differing wear of the screens is at once suggested.

Mill.	Life of screens. Days.
Hidden Treasure.....	81
Prize.....	75
Gregory Bobtail.....	60
New York.....	25
Randolph.....	16

The Hidden Treasure receives water which is comparatively clean, and after having used it returns it to the creek together with the addition of a certain percentage of sulphuric acid, as sulphate of iron, derived from the contact of the water with the pyrites in the ore under conditions favorable to a certain amount of solution. The wash of the water in the battery and the elevation of its temperature due to its rapid agitation under the stamps are causes operating to aid a chemical action upon the metallic sulphides in the ore. The water now reaches the Prize Mill where its slightly increased acidity reduces the life of the screens from 81 days to 75. The Prize in turn contributes its share of sulphates which again help to injure the screens of the Gregory Bobtail, which mill is a little farther down the creek.

At this point the stream receives the very acid waters which issue from the underground workings of the Gregory mine, and in addition, before it reaches the New York mill, the water has washed past banks whose sand is all more or less charged with partially oxidized pyrites, so that when it at length reaches the two lower mills the wear of the screens is measured by days instead of weeks.

The action of the acid sulphate of iron formed from the decomposition of pyrites is probably injurious, not directly but indirectly by the formation by the reaction, with carbon-dioxide contained in the battery water, of bicarbonate of iron, which last has a strong corrosive effect, and tends

to eat away the edges of the openings of the screens, and so rapidly to decrease their time of service.

Taking the case of the Hidden Treasure as the most typical we find that 432 tons of crushed ore are passed through a screen before it is considered worn out. This was the average for 1891. At Grass Valley a screen will live to pass through 200 tons, and at Bendigo (Australia), 134 tons.\* Among the factors tending to allow the screen a long life must be noted the very roomy character of the mortar boxes in this district.

Coming to the question of the loss of mercury, we find it to vary from 3-7 to 9-8 dwts. per ton of ore crushed. The two mills which show the greatest consumption of quicksilver have also the deepest issue, and it may be that the further stamping of the mercury, added to the ore in the mortar box, may be among the causes of increased loss. The increased agitation under the stamp causes more "flowing," that is, the subdivision of the mercury into minute globules, which become coated with a film of foreign matter, the finely pulverized pyrites for instance, which prevents their coalescing afterward and so renders them readily borne away by the water to become a part of the value of the tailings heaps in the creek outside the mill. This is probably so to a certain extent, but the variable loss of mercury at any given mill and therefore probably between any two given mills lies mostly in the fact that the more lots of ore that are treated the greater the expense under this head. All these mills are to a greater or less extent custom mills and treat ore coming from a large number of mines. Every lot requires separate crushing; when finished the plates must be each time cleaned up, the amalgam collected and then retorted, operations all of which mean manipulation and consequent mechanical loss of mercury. The two mills showing the largest figures under this head of mill expenditure are the two which treat, more so than the others, a large number of small lots of ore.

(To be concluded.)

[The publishers of the "Engineering and Mining Journal" will thank the readers of this article, the first of a series by Mr. Rickard, if they will promptly call attention to any inaccuracies they may observe in it. The author will also be pleased to receive any communication correcting or adding to the information given. Correspondence on the subject is solicited.]

TENDERS FOR BUILDING THE NEW CROTON DAM.

The contract for building the Croton Dam at Cornell in the town of Cortlandt, was awarded on Friday, Aug. 25, by the Aqueduct Commissioners to the lowest bidder, James S. Coleman. Mr. Coleman's bid was \$4,150,573.

Chief Engineer Fteley's original estimate of the cost of the dam was \$4,574,820, consequently Mr. Coleman's bid is \$424,247 below that figure.

There were five bids made, ranging from \$4,150,573, the lowest, to \$4,527,769 the highest, all of which, it will be noted, are below the estimated cost. Each bidder had to deposit \$40,000 before his bid was received, and the contractor must now give bonds for \$500,000 for the proper completion of the work:

Mr. Coleman must complete the work in seven years.

The dam will be placed about midway between the present Croton Dam and Quaker Bridge. It will consist of a combination of masonry and earthwork, and will be built across the valley of the Croton River. The dam will be 1,200 ft. long, 680 ft. of which will be masonry. The spillway will be 1,000 ft. long. It will be about 160 ft. high at the highest portion of the masonry section, and the foundation will extend about 80 ft. below the river bed. The base of the dam will be 185 ft. thick in some places and the crest will be 20 ft. thick. The outer face will have a slope of 2 vertical to 11-2 horizontal. The highest portion of the earthwork section will be 120 ft. above the present ground level. Its apex will be 30 ft. wide and on this there will be a roadway of 18 ft. width.

The earthwork is to be laid in six-inch layers. The excavation for the base of the dam will be carried down 125 ft. The stone work will be of rubble masonry, and it will be faced with cut stone. The spillway, which will be 24 ft. lower than the dam proper, will be of masonry lined with cut stone.

The new dam will raise the water in the Croton River 36 ft. above the top of the present Croton Dam, and will impound 34,000,000,000 gallons of water.

The following table shows Chief Engineer Fteley's estimates and the prices for which Mr. Coleman will do the work:

Engineer's Estimate.	Items.	Quantities.	Mr. Coleman's Prices.
\$700	Soil, excavated and placed, cu. yds.	2,000	\$1,000
3,000	Sodding, sq. yds.	10,000	3,000
275,000	Earth excavation, cu. yds.	550,000	335,500
43,750	Earth excavation in vertical trenches, cu. yds.	35,000	33,250
270,000	Refilling and embankment, cu. yds.	900,000	225,000
1,350	Earth hauld, 3% of cu. yds.	150,000	1,120
450,000	Rock excavation, cu. yds.	300,000	585,005
8,000	Permanent timber work, M. ft. R. M.	200	8,000
5,400	Permanent timber work, tongued and grooved, M. ft. R. M.	120	5,400
20,000	Cribwork, cu. yds.	8,000	24,000
3,000	Portland cement, barrels.	1,000	3,000
45,000	Concrete (American cement), cu. yds.	10,000	45,500
17,820	Concrete (Portland cement), 132% of cu. yds.	3,000	18,018
24,000	Brick masonry, cu. yds.	2,000	20,000
2,350,000	Rubble (American cement, 2 to 1, cu. yds.	470,000	1,903,500
198,000	Rubble (Portland cement, 2 to 1, 132% of cu. yds.	30,000	160,350
305,000	Rubble (Portland cement, 3 to 1, 122% of cu. yds.	50,000	247,050
30,000	Dry rubble, cu. yds.	12,000	30,000
7,500	Rip rap, cu. yds.	5,000	8,750
15,000	Broken stone, cu. yds.	10,000	15,000
35,500	Block stone masonry, cu. yds.	2,500	37,500
75,000	Granite dimension stone masonry, cu. yds.	2,500	87,500
360,000	Facing stone masonry, cu. yds.	24,000	324,000
4,500	Face work for rubble, sq. ft.	15,000	6,000
16,500	Fine hammered (six-cut) face dressing, sq. ft.	22,000	14,300
4,800	Rough-pointed face dressing, sq. ft.	12,000	4,800
4,000	Highway fence, lineal ft.	8,000	4,000
4,574,820	Total.....		\$4,150,573

\* Or 120 tons of 2,240 lbs.



IMPROVED TAINTOR SAW SET.

This saw set, manufactured by the Taintor Manufacturing Company, of New York, differs from the set illustrated in the Engineering and Mining Journal, August 1st, 1891, in many important points. It is designed for use on all saws, from the finest cross-cut to the largest rip saw. Fig. 1 shows the arrangement of the set and its working parts. The anvil, which is shown in section in Fig. 1, and in perspective in Fig. 2, is made with sixteen faces of different pitch. Turning the anvil to any desired pitch, it is held in place by the set screw and small pin on under side, which pin is held by the slots as shown in lower view Fig. 2. The faces of the anvil are of four different lengths, arranged in four sections, A, B, C, D. The punch is operated by a lower handle, which, when moved drives the punch against the tooth; at this point the upper handle moves downward, and brings the long face of the anvil against the saw blade. The punch holding the top of the tooth against the short face gives the saw-tooth the desired set. Fig. 3 shows the set and saw as used. The advantages claimed for this set are that a saw may always be set the same; that it will not break even the most brittle steel; that no slipping in setting is possible, and that the set is permanent. The firm makes the statement that "binding a tooth is not setting it." And that the set described gives any desired pitch, each tooth positively the same and the pitch remains until saw is resharpened.

CALCULATION OF CHARGE FOR THE LEAD BLAST FURNACE.\*

*Introductory Remarks.*—In calculating a charge for the lead blast furnace, the typical slag corresponding best to the character of the ore is selected, and the necessary amount of fluxes and fuel then determined. Other considerations are the amount of lead that the charge will contain, the richness of bullion to be produced, and the quantity of speiss, matte, and slag that will ensue from the charge. A complete calculation will give full information on all these points.

To begin with the necessary amount of lead, which is expressed in per-

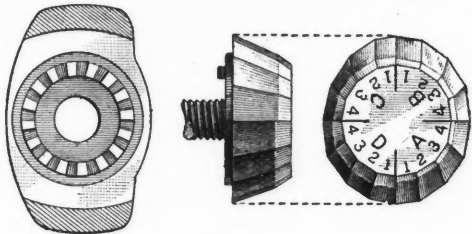


FIG. 2.

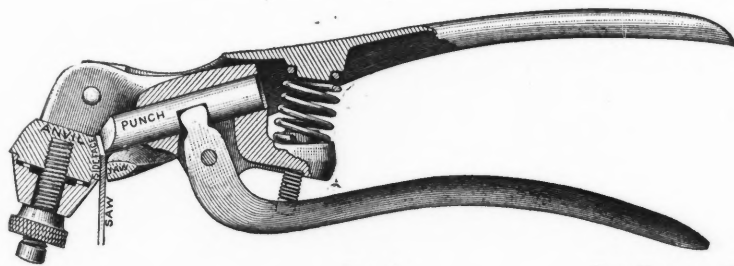


FIG. 1. THE TAINTOR SAW SET.

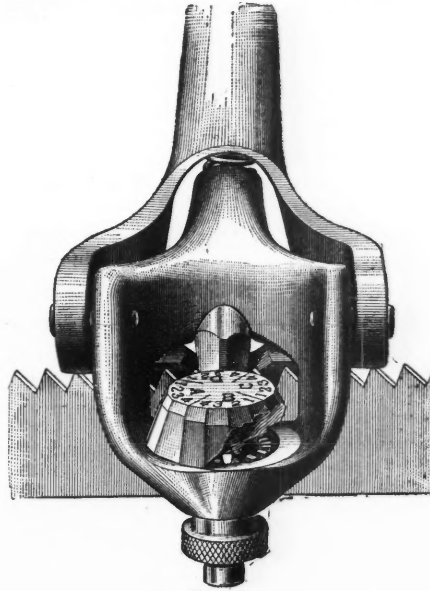


FIG. 3.

centage having reference to the sum of ore and fluxes: charges with as little as 6.5% of lead have been run successfully; the highest, with from 25 to 30%, is hardly ever reached. With pure ores, containing little or no zinc, arsenic, or antimony, and not much sulphur, it is safe to go as low as 8%; if these impurities are present to any extent, the charge should contain not less than 12%. Ordinarily the lead in charges ranges from 12 to 18%. It is to be noted that more lead is lost by volatilization with a charge low in lead than with one that is high; the loss in silver depends mainly on the loss of lead and on the richness of the base bullion.

For calculating a charge, a carbonate ore containing some galena may serve as an example. Its composition is:

SiO <sub>2</sub>	FeO	MnO	CaO	MgO	BaO	ZnO	Al <sub>2</sub> O <sub>3</sub>	S	As	Pb	Cu	Ag, ozs.	Au, ozs.
32.6	14.8	1.3	2.2	1.4	1.5	2.4	2.5	4.4	0.5	20.7	2.9	50.5	trace

The typical slag shall be: 30SiO<sub>2</sub>—40FeO—20CaO.

The charge shall weigh 1,000 lbs. and contains 10% of slag; the fuel coke, shall be 15% of the charge. The analysis of the iron ore shows:

SiO <sub>2</sub>	FeO	MnO	CaO
4.3	74.1	1.7	3.1

that of the dolomitic limestone,

SiO <sub>2</sub>	FeO	CaO	MgO
2.7	4.5	37.3	11.9

The coke contains 10% of ash, consisting of

SiO <sub>2</sub>	FeO	CaO	MgO	Al <sub>2</sub> O <sub>3</sub>
40.3	26.5	6.9	2.4	20.4

Before beginning the calculation it is necessary to bring the different slag-forming components of ore, fluxes and fuel under the three main heads of silica, ferrous oxide and lime.

The atomic weights of iron and manganese being very nearly the same, 56 and 55, the two oxides are simply added. Both ferrous oxide and metallic iron have to be considered in the calculations:

$$\text{FeO} \times \frac{7}{9} = \text{Fe}; \text{Fe} \times \frac{9}{7} = \text{FeO}.$$

It will also be necessary to express the equivalents of one component (ferrous oxide) in terms of the other two (silica and lime).

$$\text{Let SiO}_2 = c, \text{FeO} = a, \text{CaO} = b, \text{ and } a + b + c = 90.$$

$$\text{FeO} : \text{SiO}_2 :: a : c, \quad \text{FeO} : \text{CaO} :: a : b.$$

$$\text{FeO} = \frac{a}{c} \text{SiO}_2, \quad \text{FeO} = \frac{a}{b} \text{CaO}.$$

Under the head of lime are to be classed magnesia and baryta. For instance:

$$\text{CaO} : \text{MgO} :: 56 : 40, \quad \text{CaO} = \text{MgO} \times 1.4.$$

In the same way CaO = BaO × 0.4.

Some metallurgists bring also zinc oxide under the head of lime:

$$\text{CaO} = \text{ZnO} \times 0.7,$$

thus cutting down the lime of a slag with the increase of zinc oxide.

The analyses of ore, fluxes, and coke-ash, changed as indicated, are:

	SiO <sub>2</sub>	FeO	CaO	ZnO	Al <sub>2</sub> O <sub>3</sub>	S	As	Pb	Cu	Ag, ozs.	Au, ozs.
Lead ore....	32.6	19.1	10.16	2.4	2.5	4.4	0.5	20.7	2.9	50.5	trace.
Iron ore....	4.3	74.1	3.10	..	..	..	..	..	..	..	..
Limestone...	2.7	4.5	53.96	..	..	..	..	..	..	..	..
Coke ash....	40.3	26.5	10.26	..	20.4	..	..	..	..	..	..

In figuring the charge five calculations have to be made to find:

1. The amount of available ferrous oxide and metallic iron;
2. The amount of metallic iron required by the arsenic to form Fe<sub>3</sub>As;
3. The amount of metallic iron required to combine to FeS with the sulphur not taken up by the copper as Cu<sub>2</sub>S;
4. The amount of flux required for the 15 pounds of ash in the 150 pounds of coke;
5. The amount of flux required to slag the silica of the lead ore.

1. Available ferrous oxide and metallic iron in the iron ore, 100 lbs. In the slag, 30 SiO<sub>2</sub> require 40 FeO. In 100 lbs iron ore there are 4.3 lbs. SiO<sub>2</sub>. These require

$$\text{SiO}_2 : \text{FeO} :: 30 : 40 :: 4.3 : x; \quad x = 5.7 \text{ FeO}.$$

The iron ore contains 74.1 per cent. FeO; deducting 5.7 gives 68.4 available FeO, or  $\frac{2}{3}$  FeO = 53.2 available Fe.

2. Arsenic and iron. 100 lbs. lead ore contain 0.5 lbs. of As.

$$\text{As} : \text{Fe}_3 :: 75 : 280 :: 0.5 : x;$$

$$x = 1.86 \text{ Fe. How much iron ore is required?}$$

$$\text{Iron ore} : \text{available Fe} :: 100 : 53.2 :: y : 1.86;$$

$$y = 3.5 \text{ lbs. iron ore.}$$

3. Copper, sulphur, iron. 100 lbs. of lead ore contain 2.9 lbs. Cu.

$$\text{Cu}_2 : \text{S} :: 126.8 : 32 :: 2.9 : x; \quad x = 0.73 \text{ S.}$$

Of the 4.4 lbs. S contained in the 100 lbs. of lead ore, 0.73 are required for the Cu; the difference, 3.67, must be combined with Fe:

$$\text{S} : \text{Fe} :: 32 : 56 :: 3.67 : y;$$

$$y = 6.42 \text{ Fe, which corresponds to 12 lbs. of iron ore, viz.:}$$

$$\text{Iron ore} : \text{available Fe} :: 100 : 53.2 :: z : 6.42; \quad z = 12.$$

For the arsenic and sulphur of 100 pounds of lead ore 15 lbs. of iron ore are required. These have: 0.66 lb. SiO<sub>2</sub>, 0.48 lbs. CaO, and 0.88 lbs. FeO. Only the non-available FeO enters the slag according to 30 SiO<sub>2</sub> : 40 FeO; the rest, i.e., the available FeO, combining as Fe with the As and S to form speiss and matte. The 0.66 lb. SiO<sub>2</sub> require

$$\text{SiO}_2 : \text{CaO} :: 30 : 20 :: 0.66 : x;$$

x = 0.44 CaO, which is balanced by the 0.48 CaO already present. If this were not the case, the 0.44 would have to be supplied by limestone:

$$\text{Limestone} : \text{CaO} :: 100 : 53.96 :: y : 0.44.$$

4. Coke-ash, 100 lbs.

*Murray's Method.*—The method used resembles very closely the one given by Murray\* and elaborated by Newhouse.† The analyses show:

Desired amount.	Material.	SiO <sub>2</sub>	FeO	CaO
100.	Coke-ash.....	40.3	26.5	10.26
x.	Iron ore.....	4.3	74.1	3.10
y.	Limestone.....	2.7	4.5	53.96

Starting again with 100 lbs. of coke ash the necessary quantities of iron ore (x) and limestone (y) can be found by expressing the amounts of FeO first in terms of CaO, then in terms of SiO (see above), and finally by put-

\*From "The Metallurgy of Lead" by Prof. H. O. Hofman, published by the Scientific Publishing Company, New York. Copyright Scientific Pub. Co.

\*ENGINEERING AND MINING JOURNAL, August 13th, 1887; March 5th, 1892. †School of Mines Quarterly, ix., p. 373.

ting these quantities equal to each other, when  $x$  and  $y$  can be easily calculated.

$$\text{FeO} = \frac{a}{b} \text{CaO.}$$

$$26.5 + 0.741x + 0.045y = \frac{40}{20}(10.26 + 0.031x + 0.539y),$$

$$x = 1.668; y = 8.80.$$

$$\text{FeO} = \frac{a}{c} \text{SiO}_2,$$

$$26.5 + 0.741x + 0.045y = \frac{40}{30}(40.3 + 0.043x + 0.027y),$$

$$x = 39.6 - 0.001y.$$

$$1.668y - 8.80 = 39.6 - 0.001y; y = 30 \text{ lbs. limestone};$$

$$x = 39 \text{ lbs. iron ore.}$$

5. Lead ore, 100 lbs. The analyses give:

Desired amount.	Material.	SiO <sub>2</sub> .	FeO.	CaO.
100	Lead ore.....	32.6	19.1	10.16
$x$	Iron ore.....	4.3	74.1	3.10
$y$	Limestone.....	2.7	4.5	53.9

$$\text{FeO} = \frac{a}{b} \text{CaO,}$$

$$19.1 + 0.741x + 0.045y = \frac{40}{20}(10.16 + 0.031x + 0.539y),$$

$$x = 1.8 + 1.52y. \text{FeO} = \frac{a}{c} \text{SiO}_2,$$

$$19.1 + 0.741x + 0.045y = \frac{40}{30}(32.6 + 0.043x + 0.027y),$$

$$x = 35.51 - 0.001y.$$

$$1.8 + 1.52y = 35.51 - 0.001y, y = 22 \text{ lbs. limestone, } x = 35 \text{ lbs. iron ore.}$$

In summing up there are:

15 lbs. coke-ash, requiring  
6 " iron ore.  
4 " limestone. Then the charge contains  
100 " slag.  
125 lbs.

The difference from 1,000 lbs. = 875 lbs. is to be made up by ore and fluxes. Now

100 lbs. lead ore require to slag the SiO<sub>2</sub>..... 35 lbs. iron ore + 22 lbs. limestone  
100 lbs. of lead ore require to combine with As  
and S..... 15 " " "

Total ..... 172 lbs. of fluxes.

$$172x = 875; x = 5.088, \text{ gives as charge in round figures:}$$

Coke-ash.....	15	Iron ore for As and S.....	75
= 150 lbs. of coke.		Limestone.....	115
Slag.....	100	Total.....	1,000
Lead ore.....	510		
Iron ore for SiO <sub>2</sub> .....	185		

Figuring the pounds of each component of the charge and adding like to like must give the slag.

By  $216.57x = 30$ , the coefficient is obtained with which the totals of SiO<sub>2</sub>, FeO, and CaO have to be multiplied to obtain the desired figures: 30, 40, 20. The table shows that the calculation is correct.

By adding the different components that go to form the slag, 665 lbs. are obtained, and any change that is to be made in the slag must be calculated as having reference to this figure.

For every 12.8 oz. of silver there are 102.5 lbs. of lead; the base bullion will therefore assay about 149 oz. of silver to the ton.

There are 10 per cent. of lead in the charge.

In the charge are 2.5 lbs. of arsenic, which, with 9.3 lbs. of metallic iron, form about 12 lbs. of speiss.

The 14.8 lbs. of copper, requiring 3.7 lbs. of sulphur, will for 18.5 lbs. of copper matte. Deducting the 3.7 lbs. of sulphur from the total sulphur leaves 19.7 lbs. which, with 34.5 lbs. of metallic iron, give 54.2 lbs. of iron matte; the total matte formed will be about 72 lbs.

The table further shows that there are 10% of slag and 15% of fuel to the charge, thus giving all the necessary data.

Before making up the charge as it goes to the blast furnace, the moisture has still to be considered. If the lead ore contains, for instance, 5% of moisture, 535 lbs. moist ore will have to be used to correspond to 510 lbs. of dry ore:

$$\text{Moist ore: dry ore} = 100 : 95 :: x : 510; x = 537.7.$$

The same is the case with fluxes and fuel.

It is to be noted that figuring a charge according to Murray's formula has one great advantage over the method next to be described, viz., that it shows in what proportions any three classes of silicious, ferruginous and calcareous ores are best mixed so as become self-fluxing.

**Common Method.**—In the common method the same ores, fluxes and fuel, and the same slag as before are taken as a basis.

The preliminary calculations, such as bringing the different components of ore, flux and fuel under the heads of SiO<sub>2</sub>, FeO, and CaO, are made in the same way. The total weight (1,000 lbs.) that the charge is to have, and with it the percentage of fuel (15%) and slag (10%) to be added are fixed. The available FeO and Fe of the iron ore are determined as before.

Two calculations are now necessary to determine the amounts of iron ore and limestone required by the coke-ash and by the ore.

The analyses of the ash and the two fluxes, iron ore and limestone, are entered, as shown by the heavy type in the table below. The 150 lbs. of coke contain 15 lbs. of ash; for these the totals of SiO<sub>2</sub>, FeO and CaO are figured and entered in the table.

There are 6.04 lbs. of SiO<sub>2</sub>; how much FeO is required?

$$\text{SiO}_2 : \text{FeO} :: 30 : 40 :: 6.04 : x;$$

$$x = 8.05 \text{ lbs. FeO are necessary;}$$

$$3.97 \text{ lbs. FeO are present.}$$

The difference,  $y = 4.08$  lbs. FeO have to be added.

To find the necessary iron ore:

$$\text{Iron ore: available FeO} :: 100 : 68.4 :: z : 408, z = 6 \text{ lbs. iron ore.}$$

These are entered in the table; their total pounds of SiO<sub>2</sub>, FeO, and CaO are figured and also entered.

To the previous sum of 6.04 lbs. SiO<sub>2</sub> have been added, by the iron ore, 0.26 lbs. SiO<sub>2</sub>, making the total SiO<sub>2</sub> for which limestone has to be provided, 6.30 lbs. How much CaO is required?

$$\text{SiO}_2 : \text{CaO} :: 30 : 20 :: 6.30 : u,$$

$$u = 4.20 \text{ lbs. CaO are necessary;}$$

$$1.73 \text{ lbs. CaO are present.}$$

The difference,  $v = 2.47$  lbs. CaO have to be added.

To find the necessary limestone (leaving out the SiO<sub>2</sub> and FeO it contains):

$$\text{Limestone: CaO} :: 100 : 53.9 :: w : 2.47,$$

$$w = 4.5 \text{ lbs. limestone,}$$

which are entered with the pounds of CaO they bring to the slag.

To see if the calculation is correct the pounds of FeO and CaO are multiplied by a coefficient (4.76, from  $6.30x = 30, x = 4.76$ ), which changes the pounds of SiO<sub>2</sub> to 30, the percentage of SiO<sub>2</sub> of the slag aimed at. The result will be 40 FeO and 20 CaO. The table gives 40.08 FeO and 19.75 CaO, showing the calculation to give sufficiently close results.

Material.	SiO <sub>2</sub> .		FeO.		CaO.	
	Dry weight. Lbs.	Per cent.	Lbs.	Per cent.	Lbs.	Per cent.
Coke ash.....	15	40.30	6.04	26.50	3.97	10.26
Iron ore.....	6	4.30	0.26	74.10	4.45	3.10
Limestone.....	4.5	2.70	.....	4.50	.....	53.90
Total.....	25.5	.....	6.30	.....	8.42	.....
Coefficient.....	4.76	.....	29.28	.....	40.8	.....

The weights of iron ore (6 lbs.) and limestone (4.5 lbs.) are practically the same as those found by using Murray's method.

Deducting 125 lbs. (the sum of coke-ash, with its iron ore, limestone, and slag) from the total weight of the charge of 1,000 lbs., gives the same 875 lbs. as before to be made up by the ore and its fluxes.

A table, like the one below, is laid out, the analytical data are entered and the calculation is made on a basis of 100 lbs. of ore.

1. The amounts of iron ore required (15 lbs.) by the As and S are calculated as shown on pages 211 and 212, and the results are entered in the table.

2. One hundred lbs. of ore contain 32.6 lbs. SiO<sub>2</sub>, for which the necessary iron has to be provided:

$$\text{SiO}_2 : \text{FeO} :: 30 : 40 :: 32.6 : x;$$

$$x = 43.46 \text{ lbs. FeO are necessary;}$$

$$19.10 \text{ lbs. FeO are present;}$$

The difference,  $y = 24.36$  lbs. FeO have to be added.

To find the necessary iron ore:

$$\text{Iron ore: available FeO} :: 100 : 68.4 :: z : 24.36;$$

$$z = 35 \text{ lbs. iron ore.}$$

3. To the 32.60 lbs. SiO<sub>2</sub> of the ore have been added from the two additions of iron ore  $0.66 + 1.50 = 2.16$  lbs. SiO<sub>2</sub>, making the total of 34.76 lbs. of SiO<sub>2</sub>, for which lime has to be provided:

$$\text{SiO}_2 : \text{CaO} :: 30 : 20 :: 34.76 : u;$$

$$u = 23.17 \text{ lbs. CaO are necessary;}$$

$$11.17 \text{ lbs. CaO are present.}$$

The difference,  $v = 11.45$  lbs. CaO have to be added.

To find the necessary limestone (leaving out the SiO<sub>2</sub> and FeO it contains):

$$\text{Limestone: CaO} :: 100 : 53.90 :: w : 11.45;$$

$$w = 21 \text{ lbs. limestone,}$$

which are entered upon the table.

Adding the pound-columns of SiO<sub>2</sub>, FeO and CaO, and multiplying by 0.86, proves that the calculation is correct.

Material.	SiO <sub>2</sub> .		FeO.		CaO.	
	Dry weight lbs.	Per cent.	Lbs.	Per cent.	Lbs.	Per cent.
Ore.....	100	32.60	32.60	19.10	19.10	10.16
Iron ore for As and S.....	15	4.30	0.66	74.10	0.88	3.10
Iron ore for SiO <sub>2</sub> .....	35	4.30	1.50	74.10	25.93	3.10
Limestone.....	21	2.70	.....	4.50	.....	53.90
Total.....	171	.....	34.76	.....	45.91	.....
Coefficient.....	0.86	.....	29.89	.....	39.58	.....

The figure found for iron ore (35 lbs.) is the same as with Murray's formula; that for limestone is slightly lower (21 vs. 22 lbs.), as the SiO<sub>2</sub> and FeO contained in the limestone are left out, making the available CaO 53.90, which is slightly too high.

If the items of the ore charge are now multiplied by 5.088 and those of the coke charge added, the sum of 1,000 pounds, the entire charge, will again be obtained.

**Steel not only loses its magnetism when heated to an orange color, but it becomes non-magnetic.** According to Prof. Silvanus Thompson, when the armature of a permanent magnet is suddenly connected full force, the magnetism becomes less, while on the contrary, the quick detaching of the armature benefits the magnet.



THE STILWELL CLOSE HEATER.

The tubes of this heater are seamless brass, U shape, fastened tightly into the tube sheet. The base on which the heater stands serves also as a mud well or settling chamber. The cold feed-water enters the heater near the steam-exit end of the tubes, offering favorable conditions for extracting the heat from the exhaust steam. The diaphragm which separates the shell into two equal sections compels the feed-water to traverse the entire length of the heating tubes, and its exit from the heater is made at a point in close proximity to the incoming exhaust steam, insuring a high temperature of the feed-water. The construction of the heater admits of its being taken apart if necessary for cleaning. This heater is manufactured by the Stilwell & Bierce Manufacturing Company of Dayton, Ohio.

ADJUSTABLE GASKET AND WASHER CUTTER.

This tool is designed as a cutter for circular gaskets up to 4 1/4 ins. in diameter, or as a washer cutter. The knife slide is arranged with two finely tempered cutting knives, adjustable by means of set screws engaging with clamp slides on the upper side of a graduated guide. Over the center pin is fitted a sleeve and spring. When the cutter is being operated this sleeve pushes up, but as soon as the pressure is relieved the spring operates and the sleeve forces the leather or other material off the point.

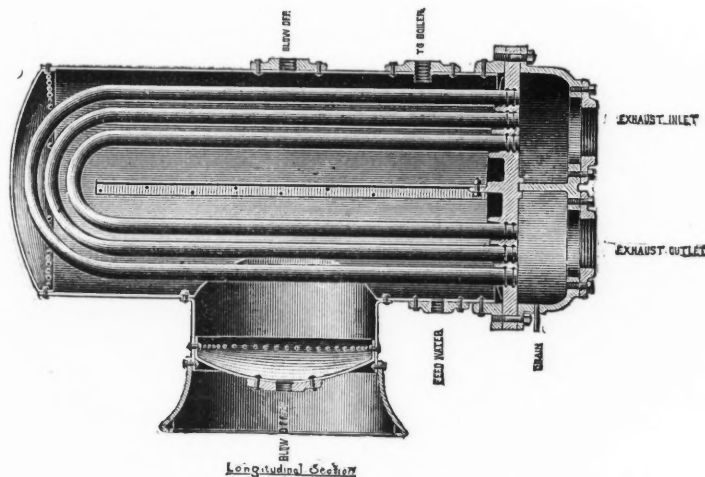
The tool may be used in an ordinary brace, or may be applied to the chuck of a speed drill. It is retailed at 75c. G. T. Moore, of New York, is introducing the goods.

SPELTER PRODUCTION FOR SIX MONTHS OF 1892.

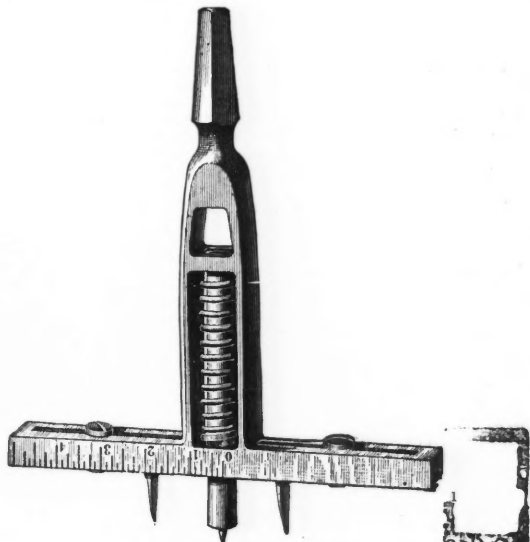
By Charles Kirchhoff, for the U. S. Geological Survey.

Reports from the producers of spelter show the following production during the first half of 1892 in short tons.

It will be observed that the rate of production has very greatly increased, and that if it continues during the second six months of the current year as it was during the first six months, the production of the country will reach the 90,000 mark, doubling since 1886.



THE STILWELL CLOSE HEATER.



GASKET AND WASHER CUTTER.

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

NAME OF COMPANY.	Paid in Aug.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in Aug.	Paid since Jan. 1st.
Adams, Colo.		\$7,500	Helena & Frisco, Mont.		\$20,000
Alaska, Tr'dw'l, Alaska		225,000	Homestake, S. Dak.	\$12,500	100,000
American Coal, Md.		45,000	Hope, Colo.		25,000
American-Nettle, Colo.		30,000	Horn Silver, Utah		50,000
Argyle, Colo.		20,000	Idaho, Cal.	6,200	27,300
Aspen, Colo.	\$20,000	80,000	Iron Mountain, Mont.		105,000
Aurora, Mich.		100,000	Kennedy, Cal.		60,000
Bald Butte, Mont.		20,000	Lake Superior, Mich.		252,000
Bannister, Mont.		6,000	Leadville Cons., Colo.		12,500
Belden Mica, N. H.	5,000	25,000	Lexington, Colo.	3,000	24,000
Best Friend, Colo.		20,000	Maid of Erin, Colo.		139,725
Brotherton, Mich.		40,000	Maryland Coal, Md.		84,000
Bull-Domingo, Colo.		4,000	Maxfield, Utah.		18,000
Bulwer Con., Cal.		10,000	Minnesota Iron, Minn.		630,000
Buxton, S. Dak.		50,000	Mollie Gibson, Colo.	150,000	1,100,000
Calumet & Hecla, Mich.	500,000	1,500,000	Monitor, S. Dak.		22,500
Centennial-Eureka, Utah.		90,000	Morning Star D., Cal.	7,200	54,000
Champion, Cal.	3,400	44,200	Napa, Cal.		50,000
Colorado Central, Colo.		41,250	New Guston, Colo.		123,750
Consolidation Coal, Md.		205,000	Omaha, Cal.		7,200
Colorado Fuel		67,120	Ontario, Utah	75,000	600,000
Contention, Ariz.	50,000	50,000	Oseola, Mich.		50,000
Cook's Peak, Colo.		400,000	Pacific Coast Borax	15,000	120,000
Coptis		15,000	Pandora, Mont.		3,000
Cortez, Nev.		95,000	Parrott, Mont.	18,000	144,000
Daly, Utah.	37,500	300,000	Plumas, Eureka, Cal.		25,313
Deadwood Terra, S. Dak.	10,000	80,000	Poorman, Ltd., Colo.		36,450
De Lamar, Idaho.		272,000	Quincy, Mich.		200,000
Dexter, Nev.	30,000	80,000	Red Cloud, Idaho.	10,000	30,000
Diamond, Kyune & Castle, Utah.		7,500	Rescue, S. N., Mex.		12,000
Elkhorn, Mont.		175,000	Rialto, Colo.		18,000
Enterprise, Colo.	50,000	250,000	R'ky Fork Coal, Mont.		100,000
Eureka Con., Nev.		12,500	Running Lode, Colo.		6,000
Franklin, Mich.		167,000	Sierra Butte, Cal.		14,700
Golden Reward, S. Dak.	5,000	35,000	Standard, Cal.		30,000
Granite Mountain, Mont.		500,000	Tamarack, Mich.		400,000
Great Western Quick silver, Cal.	12,500	87,500	United Verde, Ariz.		30,000
Hecla Con., Mont.	15,000	120,000	W. Y. O. D., Cal.	3,000	24,000
			Yosemite No. 2, Utah.		5,000
			<b>Total</b>	<b>1,053,300</b>	<b>9,993,000</b>

Stocks of spelter on the 1st of July were about as given. The increase in the stocks on hand has taken place solely in the Eastern and Southern States.

	Production.		Stocks.			
	1891.	6 mo's 1892.	Jan. 1, 1890.	Jan. 1, 1891.	Jan. 1, 1892.	July 1, 1892.
Eastern and Southern States.	12,626	6,901	1,149	788	2,360	3,153
Illinois.	28,711	15,433	304	68	...	27
Kansas.	22,747	14,161	1,075	233	294	381
Missouri.	16,253	8,954	43	45	61	10
<b>Total</b>	<b>80,337</b>	<b>45,499</b>	<b>2,530</b>	<b>1,134</b>	<b>2,715</b>	<b>3,601</b>

**Theory of Physiological Action of Rapidly Alternating Currents of High Potential.**—Prof. E. J. Houston, in a paper recently read before the Franklin Institute, attempted to explain the curious fact discovered by Tesla, that electric currents of extremely high potential and alternating with great frequency—such as 20,000 times a second—have no injurious effect upon the human body, while currents of lower potential and alternating much less frequently would instantly destroy life. According to Professor Houston's theory, the alternations take place so rapidly that the superficial portions only are traversed by the discharges. The more deeply seated, vital organs being thus free from contact, such discharges are necessarily harmless. As the frequency of alternation increases, the body becomes more and more protected, until, when the frequency becomes as great as that of the other waves which cause sunlight, they would probably produce on the surface of the body the same genial effects as are produced by the light and heat of the sun, with which they are probably identical.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, AUGUST 30TH, 1892.

481,550.	Ore Washer and Concentrator.	Arthur L. Dana, Colorado Springs, Colo.
481,592.	Mining Cage or Car.	Ernest Schillo, McDonald, Pa.
481,595.	Furnace Grate.	Ephraim C. Sooy, Kansas City, Mo.
481,598.	Rock Drilling Machine.	William X. Stevens, Washington, D. C.
481,610.	Rock Drilling Machine.	Nicholas Widman, Mascoutah, Ill.
481,625.	Azimuth Circle.	Edward S. Ritchie, Newton, Mass.
481,632.	Steam Actuated Rock Drill.	Seth Lloyd and William R. Lloyd, West New Brighton, N. Y.
481,656.	Cutter or Drill Applicable to Coal, etc.	Hans Renold, Manchester, and Walter T. Goolden, Llewelyn B. Atkinson and Sydney C. G. Gold, London, England.
481,676.	Apparatus for Generating Ozone.	Christopher C. Sharp, Chicago, Ill.
481,680.	Apparatus for Treating the Refuse of Cities.	Jacob J. Storer, East Orange, N. J., Assignor to Mary L. Storer, same place.
481,683.	Method of and Apparatus for Extracting Gold and Silver from their Ores.	Jonas W. Aylsworth, Orange, and Arthur C. Payne, Elizabeth, N. J.
481,703.	Leverberatory Smelting Furnace.	Henry Mathey, South Riverside, Cal.
481,719.	Smoke Consumer.	James Sargent, Rochester, N. Y.
481,754.	Coal Screen.	Samuel Griffiths, Weir, Kans.
481,775.	Electrically driven Machinery for Cutting Coal.	Llewelyn B. Atkinson and Claude W. Atkinson, London, England.
481,776.	Machine for Making Sheet Metal Chains.	Henry J. Austin and Robert T. Lewis, Jr., Waterbury, Conn.
481,781.	Rheostat.	Charles E. Carpenter, Minneapolis, Minn., Assignor of one-third to W. S. Andrews, New York, N. Y.
481,799.	Apparatus for Use in Casting and Working Metals.	William E. May, London, England.
481,838.	Impregnating Liquids with Gases.	Ulrich Bachmann, Mission San Jose, Cal.
481,850.	Air Compressor.	Michael Dillenber, San Francisco, Cal.
481,866.	Adjustable scraper for Roller Mills.	John Harvey, Brooklyn, N. Y.
481,885.	Open Hearth Furnace.	Henry Aiken, Pittsburg, Pa. Frederick W. Wood Baltimore, Md., and Harry H. Campbell, Steelton, Pa.

## PERSONALS.

Mr. W. de L. Benedict, mining engineer, of this city, has returned from British Columbia where he recently examined some mineral property.

"The Engineering and Mining Journal is the most reliable and most capable class journal in the world." "Quidnunc" in "The Australian Mining Standard" June 4th.

Mr. J. H. Mills, late of the Societe des Mines de Lexington of Bingham, is to operate the Gervase-Brown process for the Groesbeck-Brown Company, the plant to be at Bullionville, Nev.

Mr. E. M. Douglass, of the U. S. Geological Survey and topographer-in-chief for Colorado, Nebraska and South Dakota, is at Deadwood, S. Dak. Topographers Fitch and Farmer are already at work with a corps of assistants in Dakota.

Mr. Edmond C. Pechin, the well-known mining engineer and metallurgist, whose communications to the Engineering and Mining Journal have attracted widespread interest, has accepted the position of general manager of the Grottoes Company, at Shen-dun, Va.

The Senate Commission to investigate the Geological Survey has not, as yet, officially signified when and where it will begin its examinations. Inasmuch, however, as it is vested with plenary powers in the premises indicated by the resolution and its field of action is very broad, it is presumed it will prosecute its duties at various points consistent with the objects of the Commission.

Mr. Byron E. Shears, a prominent mine and land attorney, of Aspen, Col., and who is one of the owners of the great "Mollie Gibson mine," and who embarked on the S. S. Spree, of the Bremen line on her last voyage out, has arrived in London. There and upon the continent, it is understood he will be occupied in carrying out some very important plans relating to a prominent American mining enterprise, in which he is largely interested.

Mr. Edward H. Carbutt, a prominent ironmaster in Yorkshire, England, has been made a Baronet. Sir Edward is a member of the Institutions of Mechanical and Civil Engineers, and of the Iron and Steel Institute. He was Mayor of Leeds in 1878 and represented in Parliament the Monmouth District from 1880 to 1886. He held a subordinate position in Mr. Gladstone's 1880-85 government. Another British scientist has been made a member of the House of Lords. This time it is Sir Lyon Playfair, who was at one time professor of chemistry in the University of Edinburgh. He was largely connected with International exhibitions and he has done good service in various offices in Mr. Gladstone's governments. He is intimately connected with general educational matters in England.

Prof. William H. Burr, who has recently been appointed to take charge of the department of engineering in the Lawrence Scientific School of Harvard University, was graduated from the Rensselaer Polytechnic Institute in the class of 1872, and during the following three years occupied positions with a wrought-iron bridge company in New York City and on the water supply and sewerage system of Newark, N. J. He was then called to the faculty of the Rensselaer Polytechnic Institute as assistant in "Rational and Technical Mechanics," which position he held for one year and was then made the head of that department. He filled that chair for eight years, and during that period published two books, "The Stresses in Bridge and Roof Trusses, Arched Ribs, and Suspension Bridges," now in its seventh edition, and "The Elasticity and Resistance of the Materials of Engineering." In the spring of 1884 he accepted the position of engineer of construction of the Phoenix Bridge Company, subsequently becoming general manager. In April, 1891, he became Vice-President of SooySmith & Co., consulting and contracting engineers.

## OBITUARY.

Baron Roger de Scilliere, who was interested in mines and mining machinery in this country, died in New York, August 24th, of Bright's disease of the kidneys, at the age of 52.

William Hailles, Sr., one of the oldest and most prominent stove inventors in the country, died at Albany, August 30th. Mr. Hailles was well known in the mechanical world from his inventions, the most important of them being base-burning stoves and sign-casting in bronze.

F. N. Gisborne, connected with Cyrus W. Field in laying the Atlantic cable, and the superintendent of the government telegraph service, died at Ottawa, Ont., on August 30th. Mr. Gisborne was 70 years of age, and well known in the scientific world for his contributions to electric discovery.

William W. Marsh died suddenly at Schooley's Mountain, N. J., on the 30th inst., aged 65 years. Mr. Marsh graduated at Princeton in the class of 1847 and was admitted to practice in all of the New Jersey courts, but relinquished his profession early to engage in work in connection with corporations in which his father was interested. William Marsh was prominently identified with the Taylor Iron Works of High Bridge, N. J., and with the iron and crucible works in Jersey City. He was a di-

rector of the Thomas Iron Company and was a large holder of iron mine interests on Schooley's Mountain. He was closely identified with the late Benjamin G. Clarke, of New York, the president of the Thomas Iron Company.

## EXPORT NOTES.

The Mexican Treasury Department has issued a presidential decree modifying the existing Stamp Law. Exporters should inform themselves of its provisions.

Chili imported from Great Britain during the month of June 2,635 tons of railway material, 221 tons of hoops, plates and sheets, and 495 tons of galvanized iron as compared with 534 tons, 129 tons and 76 tons respectively in June 1891.

The Argentine Republic during the month of June imported from Great Britain 565 tons of bars and angles, 1,640 tons of railway material, 365 tons of iron and steel wire, 300 tons of hoops, sheets and plates, and 1,664 tons of galvanized sheets, as compared with 680 tons, 8,839 tons, 487 tons, 303 tons and 215 tons respectively in 1891. During the year 1891, the value of railway material imported was £3,209,400 against £6,814,800 in 1890.

Acting on information from the United States Consul-General at Paris, and the United States Consul at Lyons, France, the Secretary of the Treasury has requested the Secretary of State to instruct United States consular officers to refuse to certify invoices of goods consigned to the United States on and after September 1st, unless the merchandise is invoiced in accordance with the metric system. He says the use of the "aune" system of measurement now employed in France on invoices of goods to the United States, facilitates frauds on the customs revenue, and that the use of the metric system would simplify commercial transactions and aid materially in getting an intelligent comparison of invoices and invoice prices.

The Leipzig Chamber of Commerce, according to "Kuhloirs," recently received a report that should be gratifying to our manufacturers. It was from Mexico and said: "Although among the American factories there is a great deal of superficial work, yet the practical part of the business is never wanting, which gives America a great advantage over Europe in the export trade. Every manufacturer is not working for himself, but as a rule one and the same standard prevails, and articles are produced one and the same size; the consequence is the orders are much more easily given and the catalogues are of real value. The catalogues in America are got up in the very best style possible and are given away with the greatest liberality."

The Export Union, of Saxony, which now numbers some 500 members, has an inland pattern store, in which 225 firms exhibit their goods. It was visited during the year 1891 by 620 foreigners interested in the products of Saxony, and by this means many new agreements and connections were established. The union along with numerous agents and correspondents has 75 permanent agencies at 30 European and 47 other commercial centers. In 921 instances it gave information concerning the credit of foreign firms, and in many cases busied itself with the legal differences which had cropped up between home firms and those abroad. Travelers engaged in the business of the union were to be found during the year in East Asia and South America. Of export orders 1,203 to the value of 720,000 mks. (against 591 to the value of 405,000 mks. in the preceding year) were received from foreign firms.

Owing to the cheapness of transportation and production, Russian oil, though acknowledged to be of an inferior quality, on account of the lower rate at which it can be sold, has been gradually superseding the American oil in Japan. Arrivals from Jan. 1st to Nov. 30th, 1891, consisted of four sailing vessels and one steamer bringing 216,573 cases of American oil from Philadelphia and one steamer bringing 30,000 cases of Russian from Batoum. Stocks at the beginning of the year were about 60,000 cases of American and 29,000 cases of Russian, and the total amount to date about 79,000 of the former and 19,000 of the latter. The total deliveries to date, therefore, are much in excess of 1890 or any previous year—about 238,000 cases in all. This includes over 31,000 cases of American re-exported to Korea and China ports. The increase in deliveries of kerosene over last year is very marked, American being 198,000 cases for eleven months of 1891, against 210,000 cases for the whole year 1890. Prices were fairly steady during the first half, say \$1.65 to \$1.70 (Mexican dollars or Japanese yen) for American and \$1.50 to \$1.60 for Russian per case of 10 gallons, but during the latter half prices have fallen to \$1.57 for American and \$1.50 for Russian, the lowest point reached for many years. A comparative difference of 8 to 10 cts. per case between American and Russian has been maintained. I fear this will not be the case with advanced quotations, but dearer oil and less difference may be expected, as the style of packing and general condition of Russian oil has greatly improved, and is now fully equal to the American. Russian oil is not so well liked, usually on account of somewhat inferior illuminating qualities and its tendency to smoke and deteriorate by keeping.

There are no chimneys or fireplaces in the houses in Malaga, Spain, says the American consul at that city, and when it is cold people suffer acutely. I looked around to get a stove, but looked in vain. There were a few (Spanish made) of what we would call in America open-faced Franklin stoves, and in these stoves was burned Cardiff coal (the only coal here), a soft, smutty article. Finally I discovered, stowed away in a foundry, a little old box stove, made of cast iron, weighing something less than a cwt., and in it I burned coke; but the fire-box was so small that at the end of the day I found that a third of my time had been occupied in feeding it. Realizing the comforts of an American stove, I sent to New York and ordered a gas stove—as gas is cheaper here than oil—and it arrived late in December, 1891. The charges from New York across the ocean, 3,000 miles, to Gibraltar, were \$5. At Gibraltar \$2 were charged for hauling it, and \$5 to get it to Malaga, a distance of 60 miles. Then there were the duties on it and the charges for inspection—looking at it with one eye, 50 cts.; and then with the other, 75 cts.; picking it up and putting it down, \$1; to the man who bossed the job, \$1.50; to the fellow who suggested how to carry it, 50 cts.—so that at the end of its long and perilous journey the bill read, \$5 from New York to Gibraltar, \$2 at Gibraltar for hauling, \$5 to Malaga, \$5.75 here for customs duties, charges, etc.; total, \$17.75, independent of the price of the stove. If the stove had come on a steamer direct from New York to Malaga it would have cost \$5, just the same as the freight would have been on it from England, and a very little less from France; but an English steamer brought it to Gibraltar, where it was transhipped to Malaga at an extra cost of \$7, and then the steamer went on its way to England. If a line of steamers could come from New York direct to Malaga loaded with canned goods, ready-made clothing, patent medicines, notions of all kinds, small American inventions, and agricultural machinery, and take back raisins, grapes, lemons, olives, olive oil, hats, wine, almonds, oranges, chick-peas, lead, and many other articles of export, then the United States could compete with England in supplying this market; but until this is done other nations will hold the field.

## WORLD'S FAIR NOTES.

The Miners' Association of Nevada County, California, is arranging to have a small stamp mill in full operation at the World's Fair as a part of its mineral display.

The French Chamber has voted an additional appropriation of \$160,000 to be expended in freight charges to and decorations of the French building at the World's Fair. The amount previously provided was \$650,000.

A large and perfect model of the Forth bridge has been secured for exhibition at the World's Fair, and an application of the management of the Gothard Railway Company, of Switzerland, for space in which to show a large model or relief map of that road has been made.

Space for Pennsylvania's oil exhibit at the World's Fair has been granted covering an area of 150 by 250 ft., adjoining Machinery Hall. Of this space the Oil Supply Company, of Pittsburg, will occupy 100 by 150. An iron building for the machinery will be erected, several deep wells will be sunk, keeping the well digging apparatus running throughout the Exposition.

An exhibit of the Ice Age is being prepared in Ohio for the Exposition, by Prof. I. F. Wright. He will collect boulders from different parts of the State, and with them fragments from the original ledges in Canada from which the Ohio boulders were brought by the ice; and specimens of scratched stones; exhibit a large glacial map of Ohio, an outline map showing the course the boulders have been brought, placard detailing the principal glacial facts, etc.

General William O. O'Neill, president of the Board of World's Fair Commissioners of Arizona, says of its exhibit, that the mineral exhibit will be particularly fine and will show an immense variety of ores, ranging from gold to coal in all the different shapes in which they are found. One feature of this exhibit will be an immense mass of meteoric iron weighing 1,500 lbs. from the northern part of the Territory, and remarkable for containing, in addition to iron and nickel, diamonds in the shape of a minute dust—an element never heretofore found in connection with meteoric waifs.

The United States Geological Survey has been for 10 years engaged in making a great map of the United States, parts of which will be on exhibition at the World's Fair. The piece, 6 ft. in length and 4 ft. in width, now ready, includes the State of Connecticut and a bit of Long Island and Eastern New York. This vast map will take at least 25 years more to complete. Its details are such that upon it will be indicated every stream, brook, hillock, mountain, valley, farm, village and city. It will show every public and private road as completely as a surveyor's map of a small township. This map, when completed, would, if spread out, cover a little over three-quarters of an acre in superficial area. In addition to this piece of the map of the United States the Geological Survey is preparing an outline map of the country, which will also be exhibited at the Fair.



It is to be spherical in shape. By it at a glance the different elevations, the tablelands, mountain ridges and the valleys will be indicated in the outline, the highest peaks of the mountains being proportionately elevated.

INDUSTRIAL NOTES.

About 400 mill men at Rhinelander, Wis., struck on the 30th ult. for a ten-hour day.

A building is to be erected in Chicago of which the interior will be, it is said, composed of aluminum and glass.

The cold rolled steel works of Nimick, Jackson & Co., Pittsburg, Pa., were burned to the ground August 24th. The loss is about \$30,000.

The Penn Iron Company, of Lancaster, Pa., resumed operations on the 29th inst., after an idleness of two months. The puddlers accepted a reduction from \$4 to \$3.65 a ton.

The Maxim-Nordenfeldt Gun and Ammunition Company, of London, state that after many trials with smokeless powders they have found that Ballistite, manufactured under Nobel's patents, gives the most satisfactory results.

The rolling mill at Greensburg, Pa., which was built to manufacture merchant iron on a new system from old steel rails and scrap, has been closed down without a trial of the process. The mill will soon resume operations in the regular way.

After a week of activity the entire steel and iron plant of Schoenberger, Speer & Co., Pittsburg, Pa., is again silent. Five departments are affected. The trouble arose out of the fixing of a scale of wages in the Bessemer steel department. Five hundred men are affected by the strike.

The Buffalo Furnace Company is building a new blast furnace at South Buffalo. The furnace will produce from 250 to 300 tons of foundry iron every 24 hours. The furnace will consume daily over 300 tons of coke, about 550 tons of iron ore, and about 250 tons of limestone. About 250 men are now at work on the plant.

The iron industries of Roanoke, Va., after a season of depression, are now about to resume work, says the Roanoke "Times." Furnace No. 1 of the Crozier Iron Works has been shut down for some time past, but in a short time it is to start up again with increased capacity, employing twenty-five or thirty more hands than formerly. Superintendent Lentz, of the West End Rolling Mill, is now in the West employing hands and making other arrangements to start up this mill at an early day.

An important electric railway installation is that of the Cayadutta Electric Railway, connecting Ponda, Johnstown and Gloversville, N. Y., as it will parallel a steam road, and electric locomotives will for the first time be in direct competition with steam locomotives. The complete construction has been undertaken by H. Ward Leonard & Co., including grading, road bed, building, steam plant, electric generators, electric overhead work, cars, etc. The road will be in operation about December 1st.

A company has been formed in England to manufacture and introduce a new telephone receiver, the invention of Messrs. A. T. Collier and Alexander Marr. Several inventions in central station telephoning are due to Mr. Marr, who, during the time that he has been chief of the telephone exchange in Manchester, has made it the most efficient of its kind in the British Isles. The new receiver is said to be the most perfect ever produced and it is impossible to obtain a clearer utterance than that which is obtained by it.

In the "American Machinist" of July 28th, Mr. T. T. Parker has a very interesting article regarding pitting in boilers. Besides some clever theories, he has this to say from a practical point of view: "In a boiler of the porcupine persuasion pitting was found in the mud drum. Acting under advice, the drum was cleaned and scraped, after which it was painted with graphite mixed with cylinder oil. Measurements of the depths of the pits were taken, and six months after they were found no deeper, and no new ones had shown up."

The second attempt to cast a sixteen-ton gun carriage at the Watertown arsenal foundry, Mass., was made August 27th. It was unsuccessful, and came very near being attended with disastrous results. The mold in which the cast was to be made was 6 ft. deep and 20 ft. square. The large furnace was distant about 25 ft., and a reservoir was connected with it. Fifteen tons of molten iron were in the furnace, while in the cupola 8 tons more were melted ready for use. When the furnace was tapped, the molten mass flew into the air a distance of 20 ft. It was caused by the dampness of the sand lining the reservoir. The molders and officer in charge narrowly escaped being covered by the metal. A third attempt will be made in a short time.

The Berlin Iron Bridge Company, of East Berlin, Conn., are putting up two iron buildings for The Randolph & Clowes Company, at Waterbury, Conn. One a casting shop, 42 ft. wide by 82 ft. long, and another a pickle room 25 ft. wide by 82 ft. long. The Berlin company are also building a new gas house for the Philadelphia & Reading R. R., at Philadel-

phia, Pa., a new retort house for the George H. Morrill Company, of Boston, Mass., and a new boiler house for the Pope Manufacturing Company, at Hartford, Conn. All of these buildings are to be of iron after the well known plans of the Berlin Company.

The use of coupon books appears to gain in favor in the mining and lumbering districts. The Allison coupon-books, advertised on another page, are used generally throughout the lumbering districts of Minnesota and Michigan, and by many mining companies, among others being the Oregon Improvement Company, at their mines in Franklin and New Castle, Wash.; The Pleasant Valley Coal Company, at Cattle Gate, Utah; The Island Coal Company, at Linton, Ind.; Monongah Coal and Coke Company, of Monongah, W. Va.; The East Tennessee Coal Company, at Jellico, Tenn., and The Richmond Coal Mining and Manufacturing Company, of Richmond, Va. The coupon-books are convenient; save bookkeepers, and should be popular both by the workmen and the companies. They do not in any way compel the workmen to deal at a company store, as has been asserted.

Japanese Railways.—In Japan there are now open for traffic 1,717 miles of railway. The only section in the neighborhood of the capital which has been opened during the past 12 months is that stretching northward to Awomou. This line, 127 miles in length, was opened in the autumn of 1891, and railway communication has thus been completed to the most northerly coast of the mainland of Japan toward Hakodadi. The only other line in progress is the filling up of a gap of five miles in the line connecting Yokohama with the northwest coast. Railway construction in Japan appears to have reached its limit for the present. The Diet has refused any further funds for the extension of government lines, and of those owned privately many at present in working order do not pay.

The British Board of Trade does not consider any electric energy meters to be sufficiently accurate for adoption in connection with the measuring of energy consumed by electric lights. They say that after carefully considering the several patterns of meters which have been submitted for their approval, they are of opinion that it is desirable that they should have further experience of a practical working of the meters in actual use before any formal approval is given. Though some of the patterns of meters which have been submitted have many merits, and the laboratory tests which have been applied have been, in several particulars, satisfactory, no meter has shown such perfection in principle, design, and construction as to justify the Board of Trade in the conclusion that serious defects might not appear in actual working.

Late advices from San Francisco bring new details of the consolidation of the dynamite companies mentioned in last week's Engineering and Mining Journal. Articles of incorporation of the Giant Powder Consolidated Company have been sent to Sacramento. The incorporators are Albert Dibblee, E. B. Pond, James B. Stetson, L. P. Drexler, Gustav Sutro, E. M. Root and Henry Epstein. The company is to consist of 50,000 shares. Of that amount 20,000 shares are to be divided among the stockholders of the Giant and Safety Nitro Powder Companies, the former to receive 14,400 shares and the latter 5,600 shares. The remaining 30,000 shares are to be placed in the treasury of the new company and are likely to be given to other powder companies which may come into the organization at some future time. Albert Dibblee, it is understood, will be president of the new company and Julius Bandmann will be the manager.

The Brooklyn Electric Railway Company, which is to be equipped by the General Electric Company (Thomson-Houston), has placed contracts for stationary engines for its power house with the E. P. Allis Company, of Milwaukee. There will be 14 engines, of an aggregate of 20,000 H. P., costing \$440,000. There will be one marked peculiarity in the engines, which forms a new departure in the construction of electrical machinery. The armatures of the electrical generator will be the largest ever constructed, as they are designed about 18 ft. in diameter. These armatures will take the place of fly-wheels on the engines. The great size of the Brooklyn armatures will necessitate a speed of between 80 and 90 revolutions a minute only. Under separate contract with the General Electrical Company, the Edward P. Allis Company will furnish the castings for the dynamos. This contract amounts to between \$80,000 and \$90,000.

It has been rumored for some weeks that the Inman Line of transatlantic steamers have been in negotiation with the London & Southwestern Railway, of England, on the question as to the possibility of making Southampton their port in Britain in lieu of Liverpool, as at present. Southampton is no doubt a more convenient landing place for London passengers, but under present circumstances it would be useless as a freight port. As freight contributes in no mean way to the income of shipping companies, the policy of changing ports is not altogether a wise one. The first exact news on the point comes to hand this week and is to the effect that the London & Southwestern Railway Company, which on November 1st next takes possession of the Southampton docks, recently purchased by it, has applied to the Southampton corporation for a

grant of 20 acres of mudlands south of the new Empress dock, for a proposed new graving dock and quay-wall, which will be 1,800 ft. long and capable of berthing two of the largest steamships afloat.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

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

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

No charge will be made for these services.

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

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

Goods Wanted at Home.

2,760. Machinery for mining, hoisting, washing and drying phosphate rock; complete plant, including engines, boilers and pumps. Florida.

2,761. Rolls, screws, jigs, etc., for cleaning and separating lead and zinc ores. Tennessee.

2,762. 16 hand dump carts or wagons to dump both sides. Virginia.

2,764. A 100-H. P. locomotive boiler complete. Virginia.

2,765. A new 10,000-gallon wooden tank. Virginia.

2,766. A 100-H. P. return tubular boiler complete. Virginia.

2,768. A 10-ton ice machine. Virginia.

2,769. A second-hand diamond drill. New York.

2,770. A few 36-in. narrow gauge cars with wheels 8-in. face for wooden rails. Alabama.

2,771. A second-hand 6 to 8 H. P. engine and boiler. Alabama.

2,772. Machinery suitable for cutting out, removing from the quarry, and slabbing marble and lithographic stone. New Mexico.

2,773. A second-hand steam drill. Alabama.

2,774. Steam trap. South Carolina.

2,775. Mining tools for a mine in United States of Colombia. Michigan.

Goods Wanted Abroad.

2,776. Illustrated catalogues of ditchers, graders, electric apparatus, agricultural implements of all sorts, rock crushers, and automatic wire-rope tramway. West Indies.

GENERAL MINING NEWS.

ALABAMA.

The Birmingham Rolling Mill is again in working order. Every department is at work with full forces, and the usual amount of iron is being turned out. The Alabama Rolling Mill, at Gate City, is also running full forces, both on the day and night shifts.

Fort Payne Coal and Iron Company.—The temporary receiver of this company makes the following statement of the company's liabilities: Bonds sold, \$212,000; bonds hypothecated, \$88,000; accounts payable, \$19,766; bills payable, \$82,655; water works bonds, guaranteed by C. & I. Co., \$80,000; DeKalb Hotel bonds, guaranteed by C. & I. Co., \$100,000; electric light bonds, guaranteed by C. & I. Co., \$25,000; interest due on above bonds and past due notes, \$47,512; amount due employees (about), \$5,000; state and county taxes unpaid, \$10,000; total, \$669,933. To this must be added the contingent liabilities from discounted paper indorsed by the company, and from accommodation notes amounting, approximately, to \$25,000. There is no money in the treasury, and every available asset of the company, including bonds and stocks in other corporations and bills receivable, have been hypothecated for loans or debts. Investors received warning from the Engineering and Mining Journal, concerning this company, a long time ago. If the credulously invested capital in it, allured by its glowing prospectus, they have no one to blame but themselves.

ALASKA.

The production of the gold placers in the basin of the Yukon River is much larger than during any previous season. The steamer "St. Paul" recently brought down \$60,000 in gold dust which was collected at St. Michaels. There are now 500 miners working in the basin. During this summer rich finds have been made in Fish River and Forty-Mile Creek.

ARIZONA.

Maricopa County.

(From our Special Correspondent.)

The Aurum Mine, Phoenix.—A half interest in this property has been sold to J. Thayer, of Phoenix, for \$15,000. The mine shows a 6-ft. lead of gold, the ore running \$40 to the ton. In this section more sales of property have been made during the last 2

months than in the 3 years previous. An offer of \$80,000 was refused the week for the Summit mine. San Bernardino County.

(From our Special Correspondent.)

The Pittsburg Mine, Needles.—This is one of the most promising prospects in the Chihuahuas mining district, and has a silver ledge 10 inches wide to 2 feet in width, which has produced as high as 400 oz. of silver per ton without assorting. Most of the best properties in the district have been bought up by Colorado capitalists who propose expending money liberally.

The Horn Mine, Needles.—This property is situated about one mile distant from the before named property. Recently a shipment of 1,100 lbs. of ore was shipped to the reduction works, at the Needles, and the return was \$835.

#### CALIFORNIA.

##### Amador County.

Amador Queen.—According to the Amador "Ledger," this mine has been attached for the sum of \$800, claimed by San Francisco attorneys, as fee for legal advice.

Crosscutting has been commenced in the Belmont gold mine at the 200-ft. level. Superintendent Tibbits states that they are in 15 ft. and cutting seams of quartz well loaded with gold, but expects to drive 40 ft. before he will reach the regular footwall vein.

##### Placer County.

Morning Star Mining Company, Iowa Hill.—Coleman Bros., of Grass Valley, and others have sold to this company the water ditch or canal in Placer County known as the Iowa Hill canal, and all the right of way in connection therewith.

##### Sierra County.

The following items are taken from the Downieville "Messenger": A 66-oz. nugget has been found in the Bald Mountain Extension mine, Forest City.

#### COLORADO.

##### El Paso County.

The following Cripple Creek items are abstracted from our exchanges: Lately the Grant Transfer Company has hauled 10 carloads of Cripple Creek ore, averaging 15 tons to the car, to Florissant for shipment to Denver. This includes five cars of concentrates from the Beaver Park stamp mill, two from the Pharmacist, two from the Gold King and one from the Benna Vista. The Pharmacist has put in a hoist and other machinery and will in future ship about one carload of ore each day. The Gold King will ship 30 tons of sacked ore to Denver tomorrow, from which big returns are expected. The mill on the Cripple Creek placer started up on the 24th ult. and the one on the Pike's Peak placer on the 25th. There are now five mills in active operation in the Cripple Creek district and at least four more will be at work on Cripple Creek ore within thirty days.

##### Jefferson County.

The gravel beds of Clear Creek, within the city limits of Golden and elsewhere, are now being successfully worked for gold. By the use of an improvement in the sluice-box laborers are able to make from \$3 to \$5 a day on gravel which has hitherto been considered worthless.

##### Lake County.

According to the Denver "Times," the new Bi-Metallic Smelting Company is meeting with great success. The plant is handling nearly 100 tons of ore per day and another stack is to be added at once. Mr. Ballou is now in Denver, and upon his return work will be commenced upon the new stack.

Matchless, Leadville.—This mine, owned by Senator Tabor, is being steadily developed and some very good shipments of good iron ore are being made daily.

Seek No Further, Leadville.—At this mine the new plant of machinery has been placed in position and work is being pushed rapidly, in order to begin shipments by October 1st, if possible.

(From our Special Correspondent.)

A. Y. & Minnie Mining Company.—These properties have again succeeded in breaking their record of ore shipments. During the month just passed 1,800 tons of ore were shipped, including 300 tons of sulphides and 1,500 tons of carbonates. The latter class is mined from the Sellers raise in No. 2 shoot and the sulphides from No. 3 shoot. The shipments have been continuous during the present month and from indications the total output will reach nearly 2,000 tons.

Doris Mining Company.—Another 4-ft. vein of fine sulphides has been opened up in the Doris, lying near the First National. The late strike was made in a drift at the 140-ft. level, 60 ft. west of the shaft, in the solid lime. But one shift is being employed at present, but on September 1st a night shift will be added.

First National.—This property, in upper Iowa gulch, was taken up on a bond recently by a local company, and, although having been operated but five days up to the present, a 5-ft. body of rich sulphides has been opened up at the 150-ft. level, 9 ft. west of the shaft. Another drift has been driven 30 ft. eastward at the same level and the lime is now found to be heavily mineralized, indicating that the main channel of a feeder probably exists in that vicinity. Ore bins have been erected and preparations completed to begin shipping at once.

Lime, Smuggler.—In the combination shaft from which these two claims are to be developed, an extension of the famous Jones gold ore chnate, measuring 3 ft. across, has just been broken into at a depth of 190 ft. The shaft will be carried down some distance further, however, after which drifting will be prosecuted in both directions on the vein.

Mahala Mining Company.—Shipments from this property during the month of August, so far, have reached only 300 tons. This ore, however, is very rich and the small output is due to the fact that but little development is now being done, the operations at present being turned toward sinking the shaft to the second contact in order to catch the big sulphide shoot at that point.

Marion Consolidated Mining Company.—An important project is under consideration by the stockholders of the Marion group, which if carried out, will result in the sinking of another deep shaft in close proximity to the Robert Emmet. The diamond drill sunk in the Emmet has proved that the big sulphide shoot of the Maid of Erin swings around to the east and runs directly through the Marion group, and it is for the purpose of catching this shoot that the company is considering the advisability of sinking a deep shaft.

Mountain Lion Mining Company.—A rich strike has just been reported from the property of this company, situated about seven miles north of Leadville. In the main incline a 4-ft. vein of fine mineral was disclosed 60 ft. from the surface, assays from which have so far given an average of 279.5 oz. silver and 6.5 oz. gold to the ton. This vein appears to pitch abruptly into the hill and was encountered in the solid lime quartz. Several attempts have been made by local parties to obtain a lease on the mine, but the owners have concluded to operate it themselves.

S. Small.—The Hibsche shaft on the S. Small has just resumed operations, and is to penetrate the second contact, where a body of good ore is known to exist, as proved by developments on the Far-Down, adjoining. The shaft is now 200 ft. deep, and will near the 300-ft. notch before the objective point is gained.

##### Pitkin County.

Della S. Consolidated Mining Company.—This company is preparing a large station and will furnish it with an extensive sinking plant to sink deep below the Cowenhoven tunnel. In other respects, says the Aspen "Times," the mine is showing up bodies of good ore above the tunnel.

Mollie Gibson Consolidated Mining and Milling Company, Aspen.—The suit of Mr. J. B. Wheeler, of New York, against Mr. J. J. Hagerman, president of this company, for the recovery of 190,000 shares of this company, sold by the former to the latter in February, 1891, has been dismissed by Mr. Wheeler. The dismissal was filed in the county court of El Paso County, on July 29th. The dismissal, we are authoritatively informed, was entirely voluntary on Mr. Wheeler's part, unconditional and without the payment of a dollar or the request for one.

##### Pueblo County.

Colorado Coal and Iron Company.—As we foreshadowed some time ago in our columns, this company is about to consolidate with the Colorado Fuel Company, arrangements to that effect having recently been made by a committee appointed for the purpose. By the terms of the deal the consolidated company—its name is not yet made public—will have a capitalization of \$13,000,000, of which \$2,000,000 will be preferred, and \$11,000,000 common stock. The preferred issue will go to the stockholders in the Colorado Fuel Company. Of the common stock \$9,250,000 will go to stockholders in the old companies, and \$1,750,000 will remain in the treasury. The consolidated company will have \$6,000,000 bonds, of which \$4,244,000 will be required to offset bonds of old companies, leaving \$1,756,000 in the treasury.

The reorganization must be completed by Nov. 15. The officers of the Colorado Fuel Company will be the officers of the new corporation.

The companies concerned in the consolidation are the Colorado Coal and Iron Company, the Colorado Fuel Company, the Grand River Coal and Coke Company, the Denver Fuel Company and the Huerfano Land Association.

The Colorado Fuel Company, which acquired the Grand River Company a few months ago, has \$1,986,000 preferred stock, \$2,641,000 common stock, and bonds for \$1,200,000. The Colorado Coal and Iron Company has a capitalization of \$10,000,000 and a bonded debt of \$3,499,000. The consolidation terms are said to have been arranged on a basis of the business done by the company in the last three years.

The Colorado Coal and Iron Company has town lot property near Pueblo, and agricultural lands. These holdings will not be included in the consolidation, but will go to a separate organization, the shares in which will be given to stockholders in the Coal and Iron Company.

The new company will have the following property: 69,000 acres of land on which there is estimated to be 400,000,000 tons of coal, 800 coke ovens, 15 coal mines with a daily capacity of 12,000 tons, steel works at Bessemer, including 3 blast furnaces of a total capacity of 300 tons per day, a rail mill, capacity 300 tons; bar mill, pipe plant, iron mines and cash and convertible assets of \$1,216,568. In 1891 the companies now consolidated produced 2,200,000 tons of coal and coke. Real estate of the

Colorado Coal and Iron Company to the value of \$7,000,000 is not included in the consolidation, but will be transferred to the Colorado Coal and Iron Development Co.; also 7,487 shares of the Bessemer Ditch Co. with \$32,000 second mortgage bonds and \$1,049,100 in bills and notes receivable for deferred payment on land sold.

##### San Juan County.

Veta Madre.—A large body of high-grade galena ore was struck recently in this mine, Galena Mountain, the property of J. C. Dunn, of Denver. The ore body is 20 ft. across the vein, carrying rich galena the entire distance.

##### Summit County.

The Denver "Mining Industry and Tradesman" says of Brick Pomeroy's scheme: "The Atlantic and Pacific Tunnel Company's advertisements state that it has hundreds of thousands of tons of ore in sight. The statement is a lie, made for the purpose of inducing people to purchase stock in the concern. It is a gigantic swindle, which has injured Colorado's mining interests in the past, and bids fair to injure them in the future. The Colorado journal which lends its columns to assist in this swindle is a disgrace to honest journalism and a curse to the State."

#### GEORGIA.

##### Lumpkin County.

Barlow.—At this mine 5 stamps are running on ore from the Doghead vein.

#### IDAHO.

##### Alturas County.

The Argent, Justice, St. Louis, Lafayette, Link, Success and Empire claims and 950 undivided ft. in the Goffre claim have been sold to Horace K. Thurber, of New York City, for \$25,000 in cash. The 550 ft. in the Goffre claim not sold to Mr. Thurber is owned by A. F. Montandon. As part of the transaction the McMahon claim was conveyed to Mr. W. H. Watt for \$2,000. Mr. Thurber takes possession immediately of the claims, ores, tools, track, royalties from leases, and every property of every description on the claims. The sale was negotiated by Nate Randall, who will probably manage operations for the new owners. The property was almost sold for \$100,000 last winter to an English syndicate.

##### Boise County.

Boulder.—This mine has been sold to New York capitalists for \$150,000, according to the Idaho "Weekly Statesman."

Pilgrim.—This group of mines has been bonded by an English company. Six men have been employed to further develop the property. Assays show the ore to be worth from \$100 to \$200 per ton in gold and silver.

Washington.—Twenty tons of rich silver ore have been shipped to Omaha for reduction. The ten-stamp gold mill at the mine is running full time.

Washington.—This mine is now being pumped out. A large amount of water still remains in the works and no ore can be extracted.

##### Idaho County.

The Hornet, Jupiter, Jersey Lily and Delaware claims, together with a mill site and water rights, have been purchased by H. W. Butler and James A. Moore. An arastra was recently completed on the Hornet and 11 tons of ore yielded, according to the Grangeville "Free Press," 86 oz. of gold. The buyers have made arrangements for a 10-stamp mill.

##### Kootenai County.

Priest Lake.—The discovery of a copper-silver ore is reported from this district. Assays show 181 oz. in silver, 33 per cent. copper, and 25 in gold to the ton. Another sample went 134 oz. in silver with a trace of gold.

#### INDIANA.

Natural gas is to be piped from this State to Chicago by the Consumers' Gas Company. Part of the work is already done. At present the Lake Shore Railroad Company is delaying the completion of the work. It has obtained an injunction against the gas company which prohibits the crossing of the tracks at 100th street.

#### KANSAS.

##### Cherokee County.

During the week ending August 27th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 2,200,090; rough ore, pounds sold, 2,132,870, zinc ore, pounds sold, 736,440; lead ore, pounds sold, 341,330. Sales aggregated a total value of \$15,242.

##### Coeur d'Alene.

Malachite.—This mine has been bonded to F. T. Morgan, of Butte, Mon., for \$25,000. The Malachite Fraction has been bonded for \$20,000. Mr. Morgan agrees to begin work within 60 days and will run not less than 400 ft. of tunnel on the Malachite and sink a shaft not less than 100 ft. on the Fraction. Mr. Morgan has the consent of the owners to ship a few cars of ore taken out in accomplishing the above work, in order to thoroughly test it, but he is not permitted to stop ore for shipment.

#### MICHIGAN.

##### Gold.

Michigan Mining Company.—An assessment of 10 cents per share on the capital stock of the company has been called, payable on or before the 19th day



of September, 1892, by stockholders of record August 17th, 1892. The board of directors have expended the last assessment in pushing the work at the mine during the months of March and April, without any satisfactory results, says the Red Jacket "News." In May the force was reduced to three men and prospecting carried along with this small force in order to fulfill the conditions of the lease. In July a pocket was struck and about sixty pounds of rich rock taken out, which it is estimated will yield \$300 in gold. The indications at this point are very encouraging, and the board deems it for the best interests of the company that more work be done to thoroughly test the vein. The funds of the company are exhausted and there is a small debt. If, after thoroughly exploring the mine where the rich rock was found, nothing further appears, the directors will settle the debts and abandon the mine.

**Copper.**

**Allouez Mining Company.**—The diamond drill at this mine is sinking toward the Calumet conglomerate, which is expected to be reached at a depth of about 400 ft. vertical or at a depth of 700 to 800 ft. on the underlay of the lode. The Osceola lode dips on to the property, and it is likely that this lode will be explored at some future time.

**Arnold Mining Company.**—The shaft is sunk on the ashbed, and is now down some 265 ft., says the Red Jacket "News." The first level, or adit, is 60 ft. from surface; the second 180 ft. At the second level there is a small drift to the west, which is in about 10 ft., the breast of which shows well in copper. The east drift is in about 43 ft., which, it is said, shows well in copper. The company will continue sinking the shaft down to where it would be intercepted by a cross-cut or tunnel from the bluff near the lake, upon the shore of which there is a good site for a stamp-mill. Through this tunnel all the rock would be taken. This tunnel would be, probably, between two and three thousand feet long, but as it would run on the course of a fissure vein, it is said that the expense of mining will possibly be paid by the copper taken out.

**Centennial Mining Company.**—Work was started August 20th to pump out the shaft sunk some time since on the Osceola lode, which extends through the Centennial property 750 ft. east of the Calumet conglomerate. This shaft is down to the 5th level, and, as soon as it is free of water, drifting will be started north.

**Quincy Mining Company.**—An opening going from Quincy into North Quincy or Pewabic appears to be in a new branch 40 or 50 ft. wide, full of masses of copper, says the Torch Lake "Times." Its trend is somewhat different from that followed in the former working, which seems to verify the opinion held by a good many, that the upper works are off the main course of copper ground. The value and extent of the new find is not yet known.

**Tamarack Mining Company.**—The Osceola amygdaloid is now worked in this mine.

**Wolverine Mining Company.**—The openings at this mine are being continued at the 5th level south of No. 2 shaft. The 6th level is only in south of the shaft a short distance, in poor ground, which will probably improve as the level is extended. The 7th level south of No. 2 is also showing up fairly well. The 7th level north of No. 2 has gone through quite a run of ground that must be called poor, though at times it shows a little copper. No. 3 shaft is sinking to the 5th level, and will probably be holed to that point some time during October.

**Iron.**

The following is the total productions of the various mines in the Lake Superior region which have exceeded 1,000,000 tons, up to June 1, 1892: Champion, 2,654,572; Cleveland, 4,716,699; Jackson, 3,126,918; Lake Superior, 5,351,282; Republic, 3,737,096; Chapin, 3,707,292; Vulcan, 1,488,761; Ashland, 1,376,514; Colby, 1,216,025; Norrie, 3,110,407; Minnesota, 3,028,585.

**Iron—Gogebie Range.**

**Lackawanna Iron Company.**—This mine has been prospected by the diamond drill to a depth of 677 ft. It passed through 111 ft. of ore. When work was discontinued, the drill was still bottomed in ore. There is a shaft on this property, 170 ft. in depth. It is the intention to enlarge it and sink to a depth of about 700 ft.

**Norrie Iron Company.**—Considerable progress has been made in the sinking of the three compartment shaft. It is 12 x 24 ft. in the clear and will be sunk to a depth of 1,500 ft.

**Iron—Marquette Range.**

The Excelsior Furnace, at Ishpeming, has gone out of blast. It had a capacity of 40 tons per day and employed 75 men. This is the last of the 5 furnaces in Marquette County to go out of blast and now for the first time since 1865 no pig iron is being produced in the district.

Work has been resumed at the Monitor. It was idle two weeks. The Michigamme and Champion are reported shipping heavily. The Cleveland and Lake Angeline companies are discussing the question of sinking a union shaft between their lines in the Lake Angeline basin, the location proposed now being covered by water. The Cleveland Iron Company has stopped diamond drilling in the northern part of the city of Ishpeming, having decided the showing did not warrant further expenditure. The last hole bored reached a depth of 500 ft. and was bot-

tommed in siderite. At the Platt, located upon the Cascade range, they are still working in ore and are about 200 feet from the shaft. Analysis of samples secured this week gives 64 per cent. iron and '025 per cent. in phosphorus.

**Lake Superior Iron Company.**—The trammers' strike at this mine has ended with no delay to the mine.

**Menominee Range.**

**Florence Iron Company.**—This company is exploring for iron on the top of the mine hill, northeast of Nos. 1 and 2 shafts.

**MINNESOTA.**

**Iron—Mesaba Range.**

We have it from competent authority that the Carnegie mills have contracted for 500,000 tons of Mesaba range ore, says the Ishpeming "Iron Ore." Mr. Carnegie has advanced a considerable amount of money for the building of the railroad line into the Mesaba. The price paid for the ore, on boat at nearest Mesaba port, is \$2.25 per ton.

**Lone Jack.**—Work on this mine, which was recently leased from A. E. Humphreys, is being energetically pushed. At present 6 pits have been excavated, all of which are bottomed in ore, and 3 being in high grade blue ore, according to the "Mesaba Range." In No. 1 shaft there is 102 ft. of ore. In all the ore shows along 900 ft. with a width of 650 ft.

**MISSOURI.**

**Jasper County.**

(From our Special Correspondent.)

Joplin, Aug. 29.

Saturday evening closed a fairly active week in the production of ore from the lead and zinc belt. The sales of ore were not up to the production on account of a declining market, many large companies holding over for better prices. Zinc ore sold at an average of \$23 per ton, the top price being \$24.50. Lead ore remained firm at \$23 per thousand. The most important event of the week was the turning up of the large new zinc smelter at Galena, Kans. Everything is reported to have moved off satisfactorily and the retorts are now charged with ore, so that the plant is now producing spelter. We hope to visit the new plant this week and give its working somewhat in detail, as it is said to be the model smelter of the United States. Following are the sales of ore from the different camps: Joplin mines, 1,808,860 lbs. zinc ore and 265,410 lead; value, \$26,898. Webb City mines, 686,050 lbs. zinc ore and 36,720 lead; value, \$7,734.15. Cartersville mines, 1,320,900 lbs. zinc ore and 163,630 lead; value, \$19,275.05. Zincite mines, 116,510 lbs. zinc ore and 3,240 lead; value, \$1,443.55. Oronogo mines, 41,470 lbs. zinc ore and 31,800 lead; value, \$995. Carthage mines, 32,860 lbs. zinc ore, value, \$377.40. Alba mines, 41,400 lbs. zinc ore, value, \$476.20. Burch Center mines, 40,020 lbs. zinc ore, value, \$460. Galena, Kans., mines, 736,440 lbs. zinc ore and 341,330 lead; value, \$15,242. District's total value, \$72,901.35.

The Crossman Bros. & Porter mine, located on the Rex. M. & S. Co. land seems to be increasing in value as the development is advanced. In four- and one-half shifts last week there was taken from the mine rough dirt which cleaned up from the concentrating mill 121,090 lbs. zinc ore and 20,070 lead. Colonel H. H. Gregg's Scotia mines and the Roaring Springs district still continue to make a lead and steady production. Edmond Otis Hovey, Ph. D., assistant on the State Geological staff, and in charge of the World's Fair geological exhibit, is in Joplin giving personal attention to the collection. He has already secured a large number of choice specimens. One mine in the Cartersville district last week produced a solid boulder of zinc blende that weighed 1,632 lbs. Wentworth mines development work is being pushed with a vim in this new and promising camp. The Pittsburg Land and Mining Co. are sinking their large working shaft and have already cut the surface run of ore as proved by the drill. They are also putting down another hole, No. 2, which cut ore at 47 ft., and continued to show more or less ore to a depth of 100 ft. The Gobbler mines, operated by Messrs. H. Grass & Co., located one-fourth of a mile south of the towns, are giving their entire attention to underground explorations. They cut the ore body at a depth of 68 ft. from which point they have driven about 250 ft. of drifts on the trend of the ore, but they have also sunk the shaft to a depth of 90 ft. in the same ore-bearing formations and are now sinking two winzes to test the formation in the drifts. Should this prove satisfactory they will then put up a concentrating plant to clean the ore.

**MONTANA.**

**Gallatin County.**

**Gallatin Asbestos Company.**—The mine is located 32 miles southwest of Bozeman. The several shafts and crosscuts of the mine aggregate 60 and 140 ft. respectively, and the development work is nearly completed. The quality of the asbestos taken out is not as fine as the Canadian article, but will stand a severe fire test.

**Jefferson County.**

**Royal Mining Company.**—The new 25-stamp mill is now under cover, and a force of 40 men are at work. Most of the crew are still at work on the mill, while others are engaged taking out ore and developing the mine. A new tunnel is also being run several hundred feet down the mountain from the main tunnel, and where the vein was exposed it proves to be larger than it is above.

**Lewis & Clarke Company.**

**Montana Company, Ltd.**—According to an official report the total output for this company during July was \$42,253; working expenses, \$40,100; 7,000 tons of ore were crushed and 1,700 tons of tailings from the dam were treated. Mr. Bayliss, reporting upon the damage done by the fire, says that the shaft is burned out from the 400-ft. down to the 1,600-ft. level. Owing to the water introduced to put out the fire and the heavy floods, the water stands half way up in the 1,000-ft. station. It has been determined to start work on the Blue Bird and Hickey mines on an independent account, working the ore produced at the Montana mill as custom ore. At the Montana mine work on the gold shoot on the 400-ft. level has had to be abandoned, it being no longer safe. A shaft is now being sunk to reach the deposit from above.

**Silver Bow County.**

**Butte.**—The week has been uneventful in mining circles, says the Butte "Daily Inter-Mountain." The force of men at the High Ore mine has been increased and the Butte & Boston Company is increasing its force of miners and smelter hands as the reduction plant is progressing. The furnaces are nearly all in operation, but are not under cover yet. There is no lack of ore. In fact, more ore is being produced than there are facilities for treating. All the mills and smelters are in full operation and there is talk of starting up the old Liquidator concentrator again. The ore shipments are heavy. Besides the large quantities that go to Great Falls and Anaconda, the shipments from sampling works are considerable. Now that the Wickes tunnel on the Montana Central is open, the shipments from the Boston & Montana mines are expected to increase.

The mine leasers are generally doing well and are extracting only the richest ore they can find, as only first-class ore will pay for the shipping. As a result a large amount of medium grade ore is accumulating. This is especially true at the Ophir, where a pile of ore is accumulating that would pay to treat if the company had a mill of its own. The Parrot and Colorado Company properties are working to their full extent and so are the Clark properties, which supply ore to the Butte reduction works.

**NEVADA.**

**Elko County.**

The De Frees mill at Tuscarora, which had been running on ore from the Coptis mine, has closed down.

The following summary of the operations in the Tuscarora mines is from the latest weekly reports of superintendents:

**Belle Isle Mining Company.**—West line crosscut, 250-ft. level, has been extended 8 ft., all the way cutting bunches of rich ore. No. 1 winze, same level, extended 4 ft.; ore not as good. Upraise No. 2, same level, extended 6 ft., showing 2½ ft. of quartz, part of which is good ore.

**Commonwealth Mining Company.**—Second level—East line drift advanced 10 ft.; have started stopes at this point. Joint west line drift extended 10 ft. in the vein, low grade. Third level—South drift from No. 1 raise has reached Queen line, in 40 ft. and commenced extracting ore. Hoisted 68 cars of ore, assay value \$23 per ton.

**Del Monte Mining Company.**—There have been crushed at concentrating works 123 tons of ore, battery assay, \$33 per ton.

**Navajo Mining Company.**—Work on the stopes above the 350-ft. level continues as usual, and the product is without material change in quantity or quality.

**Nevada Queen Mining Company.**—North intermediate drift from chute is 2 in Commonwealth line 1 3 ft. North immediate drift from chute 6 has connected with gangway 150 ft. from chute 1; both drifts have exposed good ore, and stopes started. No. 4 raise has been put up 45 ft. in porphyry. Joint west line drift extended 10 ft.; joint east line drift advanced 10 ft. Hoisted 11 cars of ore; assay \$75 per ton, and 216 tons sent to concentrating plant, average assay \$24 per ton.

**North Belle Isle Mining Company.**—No. 2 upraise, south 500-ft. level, extended 6 ft. Work has been resumed in No. 1 north drift, south 400-ft. level, and it has been extended 2 ft. The stopes throughout the mine have yielded better this week.

**North Commonwealth Mining Company.**—Shipped to concentrating plant, 123 tons of ore; average assay, \$33 per ton.

**Esmeralda County.**

(From our Special Correspondent.)

**Mt. Diablo Mining Company, Cordelaria.**—A shipment of bullion consisting of six bars containing 7,034 oz of silver has been received at the San Francisco office.

**Lyon County.**

(From our Special Correspondent.)

**April Fool Mine.**—Last week reference was made to this claim which has developed so well. The sale of this and several adjoining claims is reported to J. Mahana, of Salt Lake City. The purchase price is in the neighborhood of \$200,000. Sinking the main shaft still continues, the bottom being in high grade ore. The last shipment of first class ore returned 214 oz. gold, or \$4,280, and 40 oz. silver per ton; the second class ore returned 265 oz. silver and 10 oz. gold.



## Storey County—Comstock Lode.

W. E. Sharon, superintendent of the Yellow Jacket, Confidence, Challenge, Consolidated and Consolidated Imperial mines, arrived in San Francisco on the 24th ult., and told a representative of the "Daily Report" that more men have been taken out in all these mines, and prospecting for new ore bodies will be vigorously proceeded with. Early in September there is likely to be enough water in the Carson River to run the Brunswick, Vivian and other water mills, and the extraction and milling of ore will then be resumed. The sinking pumps in the Crown Point and Belcher, Mr. Sharon says, are all ready to start. They were tested recently and worked well. The debris from the cave in the drain tunnel has been all cleared away and they are now putting wooden drain boxes in the tunnel. This work will take about ten days to complete, and then the pumps will be started in earnest, and Mr. Sharon says he believes that the water in the lower levels of all the Gold Hill mines will be taken out with comparative rapidity.

Chollar Mining Company.—The Chollar mill closed down on the 21st ult., says the Virginia "Chronicle," owing to necessary repairs to be made to the water tank on the eastern slope of Mt. Davidson that supplies the motive power of the mill. Owing to the shut-down of this mill, which crushed the ore from the Chollar, Potosi and Savage mines, and since many of the miners are absent at the encampment in Carson, work in the stopes of the three above-mentioned mines has been suspended. It is thought it will take five or six days to make the repairs to the water tank, when the mill will be started and a full force put on in the underground workings of the mines.

Consolidated California & Virginia Mining Company.—This company's account current for the fiscal month of July shows that the company lost over and above its receipts in that month the sum of about \$12,500, and went into the fiscal month of August with only \$5,500 on hand, against \$15,000 on hand at the beginning of the previous month. The delay in getting the returns was due to the Carson Mint being closed for quite a period, owing to the death of its former superintendent.

Consolidated Imperial Mining Company.—The main north drift on the 300-ft. level is being repaired. No ore is being taken out of the mine at present.

Confidence and Challenge Consolidated Mining Companies.—The joint northwest drift on the surface level is now in 993 ft. from the Yellow Jacket shaft. The face is in clay and porphyry. The joint east crosscut, No. 3, on the same level, is out 22 ft., having been commenced during the week. The joint north drift and joint west crosscut from the north drift on the 100-ft. level are being repaired. No ore is being taken from the mines at present.

Crown Point Mining Company.—Work on the 230-ft. level has been stopped for the present and prospecting is now confined to the 160-ft. level, where we are following south on the ore on the second, third and fourth floors. The pay maintains its width, varying from 2 to 4 ft., but is hardly of as good grade as heretofore.

Overman Mining Company.—At a special meeting of the directors of this company on the 24th ult. the following report of the investigating committee, composed of Morris Schmitt and Warren B. English, was presented and accepted and will be acted upon. Your committee, on the advisability of leasing or purchasing a mill, begs leave to report as follows: We visited Gold Hill, and after a careful investigation of the property of the company at that place find that the stopes and breasts of ore exposed to view on the different levels, in our judgment, amount to 7,000 or 8,000 tons. We are informed by the superintendent, A. Lackey, that the present outlook is a great deal better and more favorable than at any time within two years, and that in that length of time ore to the amount of 42,500 tons and 1,615 lbs. has been extracted and milled. The ore will average, in the opinion of the superintendent, about \$17 per ton, some going probably higher and carrying about 35 per cent. of its value in gold. Taking these facts, and judging from the past, we are of the opinion that it would be to the interest of the stockholders to endeavor to lease a mill on favorable terms, or if not; to purchase one, if one can be procured at a reasonable amount and on terms reasonably favorable to the company.

(From our Special Correspondent.)

The following is the weekly statement of ore hoisted from Comstock mines and milled, the car and battery assays, hulletin shipments, etc:

Mine.	Hoisted, tons.	Car sample assay.	Milled, tons.	Average battery assay.	Bullion product, week.	Bullion shipped, \$
Con., Cal. & Va.....	99	25.67	989	22.34	.....	131,649.96
Gould & Curry.....	77	15.23	165	18.48	.....	.....
Occidental.....	175	.....	175	19.20	.....	.....
Overman.....	.....	.....	.....	.....	.....	5,500.00
Potosi.....	431	25.21	432	24.36	.....	410 lbs.
Savage.....	639	25.71	450	21.00	6,584	.....
Yellow Jacket.....	.....	.....	.....	.....	.....	.....
Belcher.....	.....	.....	.....	.....	.....	32,689.74

<sup>1</sup> Total shipments on August account. <sup>2-5</sup> Cars. <sup>3</sup> Received at San Francisco. <sup>4</sup> Crude Bullion.

Hale & Norcross Silver Mining Company.—Judge Hebbard, in rendering a decision on the motion to relax costs in the suit of Fox vs. the Hale & Norcross Mining Company, cut the account down to \$940.40.

Savage Mining Company.—The report of the bullion yield of the mine during the month of July and has just been made public and is as follows: Tons ore crushed, 2,250. Bullion product: Gold, \$9,823.47; silver, \$25,508.69; total, \$35,332.16. Discount on silver, \$9,396.06; net account cash, \$25,936.10; average battery assay, \$20.98; average car assay, \$25.04; per cent. of battery assay saved, \$74.83.

Negotiations are in progress which, if brought to a satisfactory conclusion, will result in the company obtaining a lease of the Douglas mill at Dayton. The mill has been used only for tailings, but can be changed to a 20-stamp mill without any great trouble. It is run by water power. Heretofore the cost of hoisting ore from the Suro Tunnel level to the surface has been about 80 cents per ton, and for transportation to the Carson River mills \$1 per ton. In the future if the ore is taken through the tunnel the rate will be 45 cents per ton, and 25 cents per ton will transport it by the narrow gauge railroad for three miles to the Douglas mill. As the mill will handle from 60 to 70 tons daily the saving will be considerable.

The efforts being made by the Savage Company and the Directors of other Comstock companies to effect a reduction in the exorbitant charges of the transportation and the wood and water companies are not likely, it is said, to be crowned with success. D. O. Mills, the mining autocrat of the south end Comstocks and banker-philanthropist, who owns 41-80 of the Virginia Truckee railroad, has refused to take any action in the matter and has announced his intention of having his "pound of flesh."

Superintendent Keating, of the Savage, has been instructed to confer with Superintendent Ryan, of the Hale & Norcross, as to which shaft shall be jointly used in future. By thus working together it is estimated that each company will save from \$3,000 to \$4,000 monthly. While all these schemes of reform are, as far as they go, to be commended, the suspicion still lingers that as "the leopard cannot change his spots," so will it be equally difficult for "Jim the reformer" and his clique to change the methods which have proven so profitable to them in the past. Nevertheless, these are steps in the right direction.

## PENNSYLVANIA.

## Coal.

A fall of coal occurred at the Kibley Run Colliery, Shenandoah. One miner was killed.

An explosion of gas occurred on the 30th ult. at No. 3 Brookside Colliery, and two miners were instantly killed. The men were engaged in the work of "robbing a pillar," when they struck a gas feeder, and the gas ignited from their lamp.

A dispatch from St. Clair says that the Dennings Colliery at Wadesville, one of the few collieries in that locality not owned by the Philadelphia & Reading Company, has been purchased by a party of capitalists from abroad, who will increase the output by more fully developing the property.

Philadelphia Reading Coal and Iron Company.—This company's statement for the month of July shows: Gross receipts, \$1,835,498.60; operating expenses, including improvements, \$1,727,693.32; profit from mining, \$107,805.28. From this is deducted \$68,000 as one-twelfth of the current year's fixed charges, leaving a surplus of \$39,805.28, a decrease of \$3,479.08 compared with the month of July, 1891. For eight months of the current fiscal year there is a deficit of \$349,237.40, a decrease of \$392,346.12 compared with the same period last year.

Philadelphia & Reading Coal and Iron Company.—The following circular was issued from this company's headquarters, at Pottsville, on the 31st ult.: "The collieries drawn to make return of prices for coal sold in August by which to determine the wages to be paid for the last half of August and the first half of September have made the following return: St. Nicholas, Philadelphia & Reading Coal and Iron Company, \$2.61 $\frac{1}{2}$ ; Eagle Hill, \$2.67 $\frac{1}{2}$ ; Thomaston, \$2.51; Bear Run, \$2.66; Alaska, \$2.55 $\frac{1}{2}$ . The average is \$2.60 $\frac{1}{2}$ , and the rate of wages three per cent. above the present basis." This is higher wages than have been paid since 1889.

## Oil.

There were 142 wells completed during August in the Pennsylvania oil regions, including 32 dry holes. The new production was 7,559 barrels. Compared with July, this is a decrease of 37 completed wells, 9 dry holes and 2,210 barrels production. The field work for Aug. 31 consisted of 74 rigs and 242 drilling wells, a decrease of 52 rigs and an increase of 39 wells drilling, as contrasted with the figures for July 31st. In the Lima oil fields of Ohio and Indiana 196 wells were completed in August, with 20 dusters and 16,104 barrels production. This is an increase of 45 wells and 3,101 barrels production over July. On August 31st these fields showed 140 rigs and 129 drilling wells, as compared with 144 rigs and 114 drilling wells on July 31st.

## SOUTH DAKOTA.

## Lawrence County.

Deadwood & Delaware Smelter.—This company on August 26th shipped a carload of base bullion to Aurora, Ill., to be refined. The smelter is running smoothly and turning out a large quantity of matte.

Harney Peak Tin Mining and Milling Co.—Superintendent Childs now gives out, says the Deadwood "Daily Pioneer," that the mill will start producing tin concentrates between the 1st and 15th of October. At the Gertie and Cowboy mines it is said that the company is stopping out ore.

Iron Hill Mining Co.—At the recent annual meeting of this company, Superintendent Cooper reported \$140,000 worth of ore in sight, estimating the value of the ore at \$14. Since shipments have been made to the Deadwood and Delaware Smelter it has been demonstrated that the ore body will run from \$20 to \$25 per ton, and as a consequence the net profit on the output of the mine in sight will be about \$80,000 greater than at first expected, says the Deadwood "Daily Pioneer."

## Pennington County.

Jupiter.—The shaft is about 80 ft. deep. The vein has been gradually widening until now it seems that there is a body of paying ore. The ore is a galena, mixed with the red and yellow oxides of lead and some black sulphuret of silver. It is said that samples of this ore have assayed as high as 160 oz. of silver to the ton, says the Rapid City "Republican." This claim is so located that the shaft can be tapped by a tunnel when it is down 100 ft.

## UTAH.

## Juab County.

Hungarian.—The tunnel is in 50 ft. and is nearly connected with the shaft. As soon as the connection is made the shaft will be sunk 50 ft. deeper.

Tintic Tunnel.—Work on the tunnel has been temporarily suspended. The design is to drive ahead and tap the ore bodies which are supposed to lie in the center of the mountain. It is now 400 ft. in.

## Morgan County.

Silver Lone.—This is a new discovery and promises well. Assays show 40 per cent. lead, 20 oz. silver and \$2 gold per ton.

## Salt Lake County.

A discovery of mineral is reported at Spring Creek district on the Jumbo claim, where a large vein of ore has been developed assaying 80 oz. in silver and \$16 in gold. There are three veins, from 2 to 6 ft. wide, and the ledge can be traced for a long distance on the surface.

## Summit County.

Cumberland.—Work in the shaft has been temporarily abandoned, says the Park City "Record," and the leasers are now jiggling on the dump of second class ore produced some years ago.

Glencoe Mining Company.—The mill has closed down owing to lack of water.

McCune Tunnel.—Several bunches of ore have been encountered that showed an assay value of 900 oz. in silver to the ton.

## Utah County.

A vein of gold and silver bearing ore is reported to have been discovered near Lehi, by G. E. Davis, who was prospecting for coal.

## WASHINGTON.

Free milling gold has been discovered on Orcas Island, in the archipelago at the north end of Puget Sound. On the Pacific Ocean beach, a little south of Cape Flattery, several miners are working a gold placer which, with the most primitive means of operation, pays them \$1 a day each. The gold is found in black sand as fine as gunpowder and very close to the water.

## Okanogan County.

Methow Coal.—These fields are turning out of more value than at first was supposed, says the Spokane "Spokesman." A tunnel which has been run in from Twisp Creek shows a 11-ft. seam of good coal, and now many hundred acres have been located back from the creek. Their development is progressing rapidly and with good results. The people of the vicinity are agitating the question of a railroad which would supply the mines at Spokane, Seattle and Tacoma with coal.

Rattler.—This mine has been sold, according to the Spokane "Spokesman," to an English syndicate for \$47,000. It is said that the average yield of the ore is \$40 per ton. Messrs. Mankin & Carr were the vendors.

## Skamania County.

Eldorado.—It is reported that Millit & McKay have struck the lead after going in 70 ft. in the crosscut. The pay streak is 22 in. wide, and a streak of 11 in. is rich. The ore runs from \$30 to \$34 a ton in silver, gold and lead.

## Stevens County.

Dead Medicine.—A concentrator is to be erected as soon as the machinery, which has been ordered from Chicago, can arrive. The concentrator will be erected by Spokane capital, says the Spokane "Review." It is to be known as the Victor Concentrating Company, and has a paid-up capital of \$25,000. The concentrator will have a capacity of from 25 to 30 tons daily, and will cost about \$20,000. The Dead Medicine has been worked steadily since March 1st, and there are at present 400 tons on the dump.

## WEST VIRGINIA.

## Marion County.

According to the Pittsburg, Pa., "Chronicle Telegraph," considerable activity prevails in the coal fields near Farmington. A local firm has recently purchased about 1,000 acres, and is shaping up a



field which will embrace about 3,600 acres. The coal at this point has been tested by the Pittsburg Gas Coal and Coke Company, and is found at a depth of 240 ft. from the railroad. The product is said to be first class in every respect. The vein is 10 ft. thick, with good covering.

## WYOMING.

Fremont County.

(From our Special Correspondent.)

A new discovery has been made in Wyoming in the Shoshone Spur which extends southeast from the Continental Divide on Wood River, 100 miles south of Red Lodge, Montana, on the Northern Pacific Railway, the nearest railway point. Camp Kerwin is built at an altitude of 9,300. All the mountains surrounding are very high, ranging from 11,500 to 14,000 ft. Prospecting is very difficult owing to the heavy fall of snow, that staying until August, and in many places not disappearing the year round. No prospecting can be done at the base of the mountains on account of the slide rock and wash, and in many places the veins are capped with a cement or conglomerate. The formation is granite and porphyry. The vein mater is quartz with some lime. The general course of the vein is northeasterly and southwesterly. The ore is chloride, and sulphide of silver, galena, gray copper and zinc blende. The veins average from 2 to 6 ft. in width and all well defined with good walls. From a large number of assays made from croppings the returns have been good, ranging from 10 oz. of silver and a trace gold to 1,500 oz. silver and 3 oz. gold, all carrying from 5 to 60% lead. Little work towards developing them has yet been done beyond the required 10 ft. assessment holes. Kerwin has about 40 log houses and a population of 40 or 50 people and only one woman. Lumber is worth \$80 per m., but other things are very reasonable. Flour is \$3 per cwt., bacon 16c. per lb. and other things on the same ratio; everything has to be packed 15 miles on horses, but a good wagon road can be made with little outlay to Kerwin and will be the coming season. No capital has yet reached the camp, not a man is working for wages, but all on their own property. Next season Kerwin will be an ore producing camp.

## FOREIGN MINING NEWS.

BRUSSELS, September 1st.—An explosion of fire damp occurred to-day in the Agraffe coal mine at Boringe, in Hainault. The explosion caused a heavy fall of coal that blocked the galleries of the mine and entombed many of the miners. Twenty-five bodies have been recovered, and eight men alive, though very seriously injured, have been taken from the mine by the rescuing party.

The explosion was due to the sudden escape of gas in a gallery of the mine 1,900 ft. below the surface. This makes the fourth disaster that has occurred in the same pit since 1848, and the total number of names on the mine's death roll is now 500. The principal disasters were on May 3d, 1891, in which 121 miners lost their lives, and one in 1879, which destroyed 123 persons. The mine belongs to the Rothschilds.

## AFRICA.

Transvaal.

The gold production of the Witwatersrand for the month of July was 101,280 oz., a falling off of 1,972 oz. from that of June.

## BOLIVIA.

The exports of tin from this country to England show a marked increase within the last few years. The production of tin since 1833 has been as follows: 1833, 493 tons; 1834, 204 tons; 1835, 224 tons; 1836, 354 tons; 1837, 982 tons; 1838, 1,363 tons; 1839, 1,389 tons; 1840, 1,684 tons; 1841, 1,559 tons; first six months 1892, 1,525 tons. There are undoubtedly large deposits of tin ore in Bolivia, and in time it will be one of the most important sources of that metal. As it is the silver ores are always associated with tin.

## CANADA.

Ontario.

Lilly.—The shaft on this mine is now down 30 ft., showing a vein 6 ft. wide. At the surface the vein was but 2 ft. wide. A quantity of ore containing about 500 to the ton in silver is ready for shipment.

Ogema Mining Company.—A large vein has been exposed at No. 3 workings, says the Algoma "Herald." The vein is 20 ft. wide with a pay streak of 6 ft. The ore is being tested at a number of places, one lot being sent to Philadelphia by the Walker-Carter process, and another by smelting. The Crawford mill is being tried at the mines.

## CUBA.

The Spanish-American Company's railway and docks near Santiago de Cuba are about completed, and shipments will commence shortly. It is also reported that the Sugar Iron Company, controlled by Philadelphia capitalists, are ready to begin shipping their iron ore.

## GREAT BRITAIN.

Forty-three of the men imprisoned by the explosion in the Parkslip mine, at Aberkensk, have been found to be alive. Thirty-five of them have been taken out; the other eight were too weak to be moved at first, but since then six have recovered and the other two died. For the remaining 100 miners there is no hope.

## INDIA.

According to the "Annual Statement Exhibiting the Moral and Material Progress and Condition of India" during the year 1890-91, the total yield of Indian coal has during the past few years increased thus: 1886, 1,389,000 tons; 1888, 1,708,000 tons; 1889, 2,045,000 tons; 1890, 2,168,000 tons. During the same period the importations of coal by sea decreased from 849,000 tons in 1886 to 605,000 tons in the year 1889, but rose in 1890, under the stimulus of a high rate of exchange between silver and gold, to 784,000 tons; of this, the bulk came from England, while 12,014 tons came from Japan and 10,017 from Australia. The use of Indian coal is extending not only on railways but on sea-going steamers.

## NOVA SCOTIA.

Cape Breton County.

(From our Special Correspondent.)

## Gold.

The Provincial Government has decided to make an exhibit of its Nova Scotian minerals at the World's Fair, and the work will be entrusted to the inspector of mines and his deputies.

Mining continues quiet. A recently opened lead at Isaacs Harbor promises so well that the Provincial Government have made a grant toward opening a road to it. The Armand mines at Montague continue to yield well, and the Queens County mines are maintaining their output.

## Coal.

Work has continued fair during the season and the steamers engaged in the Gulf trade are promptly loaded. Receivers at Montreal claim that receipts are 50,000 tons more than to this date last season, and are asking a halt in shipments. The new collieries, the Emery and Gardiner, are both in fair shape, and it is reported that the Low Point Company are shortly to make an opening on a recently discovered seam, said to be specially adapted for bunker. The Bridgeport area and colliery, owned by the General Mining Association, is reported sold to the International Coal Company for \$100,000. The Sea Coal Bay Company are engaged in building a wharf, and expect shortly to commence shipping.

## Cumberland County.

The sale of the Joggins Mines is reported to some New York capitalists, and preparations are to be made for an increased output. Work has been comparatively dull at the Springhill Mines, the mildness of last winter having saved the coal stocks of the different railways. Screening and dumping at the north slope of these mines will shortly be done away with, as the boxes from it will run on self-acting inclines to and from the west slope screens.

## Pictou County.

Except at the Intercolonial Colliery, which is engaged in filling large orders for the Intercolonial and Grand Trunk Railways, work is very dull.

## CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Sept. 2.

Heavy Chemicals.—Business in the heavy chemical market has been light. There has been rather more inquiry for carbonated soda ash on account of the starting up of the glass works, but trading has been confined to the filling of orders contracted for sometime ago. On the whole the market is steady and shows but little or no change either as to general features or as to prices. Our quotations are: Caustic soda, 60%, 3-17½@3-20c.; 70%, 2-95@3-12½c.; 74%, 2-97½@3-12½c.; 76%, 3-12½@3-25c.; 77%, 3-12½@3-25c. Carbonated soda ash, 48%, 1-60@1-62½c.; 58%, 1-52½@1-55c. Alkali, 48%, 1-50@1-55c.; 58%, 1-47½@1-52½c. Sal soda, English, 1-07½@1-15c.; American, 1-05@1-10c. Bleaching powder, 2-15@2-20c., on the spot, according to quantity.

Acids.—Practically there is no change to note in this market. Business continues good; better than is usually the case at this season. Prices have stiffened and manufacturers report a steady trade. We quote this week: Acid per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, \$1.60 @ \$2 according to quality; muriatic, 18", \$1@1.25; 20", 90c.@1.10; 22", \$1.25@1.50; nitric, 40", \$4; 42", \$4.50@4.75; sulphuric, 85c.@1.10; mixed acids, according to mixture; oxalic, \$7.25@7.75. Blue vitriol is quoted all the way from \$3.25@3.50; alum, lump or ground, \$1.70@2. Glycerine for nitro glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The market for Sicilian brimstone continues practically as last reported. Prices, if anything, are slightly lower. Our quotations this week are as follows: To arrive, near due, \$24.50 for best unmix second, and \$23.50 for best unmix third. September-October shipments are quoted at \$23.75@24 for best unmix second and \$23@23.25 for best unmix third.

Fertilizers.—There is a better inquiry for the various fertilizing chemicals, and dealers are now preparing for the rush of the opening season. Ammoniates have been in very fair demand and prices continue firm. Owing to the cholera scare some interest has been manifested by users of German potash salts, but it cannot be stated that as yet trade in these has been greatly stimulated by the reports of the probability of delayed shipments in the future. Prices show but little change. We quote this

week: Sulphate of ammonia, \$2.87½@2.95 for bone goods and \$2.90@2.95 for gas liquor. Dried blood, \$2.05@2.10 per unit for high grade and \$2 for low grade; acidulated fish scrap, \$13.50 f. o. b. factory; dried scrap, \$23@23.50. Azofine, \$2. Tankage, \$18@22, according to grade. Bone tankage, \$22.50 @ \$23.50; hone meal, \$23.50@25.50.

Double Manure Salts.—Quotations are as follows for lots of from 10 to 50 tons ex-vessel New York, 48-53%, \$1.13½@1.23½; 00 95%, \$2.13@2.23½.

Kainit.—There is nothing new to report in this market. Prices remain \$8.75 for invoice weight and \$9 for actual weight, New York and Philadelphia.

Messrs. Couper, Millar & Co. send us the following report of the fertilizer market in the United Kingdom, dated London, August 16th: "No improvement to report in business, but prices of raw material are steady, though sales are difficult to make. From Florida advices we gather that large shipments are being made of hard rock and pebble phosphate, even though this is the wet season of the year, and the importance of this comparatively new source of supply shows itself more and more as time goes on. The low prices ruling make raising at a profit impossible in some of the older-worked deposits, which, however, does not tell much, the Florida supply being so ample. With dearer winter freights prices will doubtless be advanced. Mineral Phosphates—Canadian shipments so far have, in some cases, been somewhat unreliable in quality. We hear of nothing offering. South Carolina offering at 7½d. Florida hard rock, 75%, selling at 6¼@9¼d.; pebble, 60%, at 7½d. Ground Somme steady at 11¼d. for 75% and 10¼d. for 70%, basis c. i. f., London. Ground Belgian continues scarce, and held for 5d. per unit, f. o. b. Antwerp. Osso—there is no inquiry for in United Kingdom. Cambridge and Bedford coprolites only in local demand.

Muriate of Potash.—During the past week arrivals have amounted to 350 tons. New sales aggregated 250 tons. The prices fixed by the Sales Syndicate prevail as follows: Fifty-ton lots or over, New York and Boston, \$1.81½; Philadelphia and Baltimore, \$1.84; Southern Ports, \$1.86½.

Nitrate of Soda.—The nitrate market continues quiet, but firm. During the past week sales have been made at \$1.97½@2 for goods on the spot.

## Liverpool.

August 24.

(Special Correspondence of Joseph P. Brunner &amp; Co.)

The monotony in our market for heavy chemicals shows no sign of lifting so far, and there is practically no change to report in the position. Soda ash continues in a strong position owing to scarcity, and orders for Leblanc makes are difficult to fill. Quotations are nominally unchanged as follows: Caustic ash, 48%, £5 6s. 3d. per ton; 67@58%, £6 7s. 6d. per ton; carb. ash, 48%, £5 9s. 9d. per ton; 58%, £6 12s. 9d. per ton; ammonia alkali, 58%, £6 7s. 6d. per ton, all net cash. For prime brands of caustic and carbonated ash, a considerable premium over above quotations would have to be paid.

Soda Crystals in fair request at £3 7s. 6d. to £3 10s. per ton less 5%. Caustic Soda is flat, orders being scarce. Quotations are nominally unchanged as follows: 60%, £9 2s. 6d. per ton; 70%, £10 5s. per ton; 74%, £11 5s. per ton; 70%, £12 5s. to £12 10s. per ton, net cash. A premium of 5s. per ton is charged for parcels under 10 tons.

The "Union" will not sell on this market for export to the States or Canada.

Bleaching Powder is scarce and steady at £7 15s. to £8 per ton net cash for hardwood packages, for all quarters except the United States and Canada. Chlorate of Potash in request at 6¼ to 6½ per lb. less 5% for prompt delivery, while some figures represent newest vlvacs for September, December but buyers are not keen to operate for forward delivery.

Bicarb. Soda is moving off at £6 15s. per ton, less 2½%. For one cwt. kegs, with usual allowance for larger packages.

Sulphate of Ammonia is more inquired for, but prices show little change and we quote £10 1s. 3d. to £10 2s. 6d. per ton for good grey 24%, and £10 3s. 9d. to £10 5s. per ton for 25%, both in double bags, less 2½% f. o. b. Liverpool.

The Alkali Company has declared an interim dividend at the rate of 5% per annum on their ordinary stock, for the six months ending June 30th last.

The following is Geo. G. Blackwell's weekly report.

Minerals.—Market steady. Manganese: Arrivals larger, but all gone into consumption; stocks further reduced, and prices still better. Borate, 7d. per lb.; sulphate, £21 10s.; oxalate, 1s. 6d. per lb.; chloride, £15; carbonate, £12 10s., steady. Magnesite (raw lump): Stocks renewed with an arrival; prices firm. Raw ground £6 10s., and calcined £12 10s. Bauxite (Irish Hill brand) firm; lump 20s., second 16s., third 12s. French chalk: Arrivals small; a good business, however, is doing at full prices; "Angel White" brand and "Silver", 90s. @ 92s. 6d. prime quality, 90s. @ 95s.; and superfine, 105s. Barytes: Carbonate, best lump scarce, and brings full prices, at 90s. @ 95s.; nuts, 70s. @ 80s.; while finest white sulphate is in demand. "Angel White", No. 1, 70s.; No. 2, 60s. @ 65s.; No. 3, 45s. Pumicestone quiet. Iron ore freely offered; prices easy; Bilbao, Irish and Cumberland easy. Santander and manganeseiferous: There is more doing. Emerystone: Good demand; No. 1 lump, \$5 10s. @ £6; smalls, £5 @ £5 10s. Fullers' earth quiet; best lump, 55s.; fine

impalpable ground, \$7; "Emerald" ground, 80s. Scbeelite, wolfram, tungstate of soda and tungsten metal firm; good inquiry. Chrome ore: Good demand for best qualities for export. Antimony ore and metal quiet; prices better. Asbestos very firm. Potters' lead ore, smalls, £10 10s@£11 10s. Calamine quiet. Strontia sulphate (celestine) quiet. Limespar steady, especially for English manufactured; old G. G. B. brand in demand at 50s. (ground). Felspar quiet. Flourspar: Best quality scarce. Ferromanganese: Prices are unchanged. Plumbago: Spanish, £5; best Ceylon lump at last quotations; Italian and Bohemian, £4 @£12 per ton; "Founders," £5@£6; Blackwell's "Mineraline," £10. French sand 20s.@22s. 6d. Ground mica, £45@£50. China clay steady, common, (18s. 6d., good medium, 22s. 6d.@25s.; best, 30s.@35s. at Runcorn). Irish moss: prices higher. Bog ore (oxide of iron) steady; finest quality 22s.@23s.

**MINING STOCKS.**

For complete quotations of shares listed in New York-Boston. San Francisco, Aspen, Col., Baltimore, Pittsburgh, Deadwood, Dak., St. Louis, Helena, Mont., London and Paris, see pages 238 and 240.

NEW YORK, Friday Evening, Sept. 2, 1892.

There is nothing of interest to report this week in the mining stock market. The volume of business has been greater than last week, but for all that great dullness has prevailed.

Practically, no change is to be noted in the Comstocks. Sales of Consolidated California & Virginia amounted to 550 shares at \$3.25@3.50. There was a solitary sale of 100 shares of Gould & Curry at 80c. and another of Hale & Norcross at \$1. Ophir was stationary at \$2.15; only a sale of 100 shares is reported. Of Savage 200 shares were sold at 70@80c. An equal number of shares of Sierra Nevada was sold at \$1.65@1.70. Other sales were as follows: One hundred shares of Yellow Jacket at 70c.; 100 shares of Best & Belcher at \$1.30; 6,500 shares of Comstock Tunnel at 13@14c.; 100 shares of Mexican at \$1.40; 100 shares of Potosi at 60c. and 100 shares of Union Consolidated at \$1.20.

Of the Tuscaroras we note sales of 300 shares of Belle Isle at 15c. North Belle Isle has levied assessment No. 20, of 10c. a share. The stock will be delinquent on October 6th and will be offered for sale on November 2d.

Of the California stocks there were sales of 1,200 shares of Astoria at 1c., 1,000 shares of Hollywood at 1c., and 800 shares of Middle Bar at 1c. Of Belmont 400 shares changed hands at 36c.; the following letter dated Sutter Creek, August 26th, has been received from the superintendent of the Belmont Gold Mine.

"Since my last report the northwest latera drift has cut the foot wall. The ore vein is 25 ft. from the Boss shaft. The ore at this point is of a good milling character. We shall drive across the vein to ascertain the width before driving north and south. The indications are now that we are on the verge of an extensive ore body."

Sales of Brunswick Consolidated aggregated 1,200 shares at 13@15c. Bodie Consolidated shows transactions of 700 shares at 33@35c. There was a single sale of 130 shares of Standard Consolidated at \$1.60.

Of the Colorado stocks we note sales of 1,900 shares of Leadville Consolidated at 15c., and of 1,800 shares of Little Chief at 35@26c. Other sales were as follows: 300 shares of Robinson Consolidated at 40c.; 1,000 shares of Silver Cord at 35@40c.; 300 shares of Small Hopes at 95c.; 100 shares of Phoenix Lead at 20c.

The Black Hills stocks were quiet this week. There were sales of 410 shares of Caledonia at \$1@1.15; 100 shares of Father de Smet at 33c., and 100 shares of Homestake at \$14.

Transactions in Alice amounted to 300 shares at 62@63c.

Of Horn Silver, 500 shares were sold at \$3.65. The annual meeting of the Horn Silver Mining Company will be held in Frisco, Utah, on October 4th. Transfer books close on the 3d inst., at twelve o'clock, M., and reopen on September 10th.

Silver Mining of Lake Valley, which had not been dealt in for a long time, this week shows sales of 350 shares at 40c.

There were sales of 200 shares of Silver King at 3c. (Assessment unpaid.)

On the official lists of the Consolidated Stock and Petroleum Exchange there appeared this week sales of 1,600 shares of El Cristo. The stock according to the official records opened at 38c. and declined to 31c.

**Boston.** September 1.

The market for copper stocks continues to rule dull and lifeless. In the early dealings there was hardly anything doing, but yesterday and to-day there has been considerable pressure to sell stocks, and prices have declined, especially for the Montana group. Boston & Montana was pressed for sale and declined from 36 1/2 to 33 1/2, without marketing much stock. The demoralization of the general market incident to the cholera scare has its effect upon these securities, and they decline easily under any effort to realize. Butte & Boston has been dull but quite steady at \$9 1/2 @ \$9 3/4 with not so much desire to sell it as was noticed last week. Calumet & Hecla sold at \$290 for a small lot, but later at \$295.

Tamarack declined from \$165 to \$158, with more offered for sale than usual. Tamarack, Jr., sold at \$24 1/2 @ \$24 3/4. Franklin was quite strong on the report of the good outlook at the mine, and sold at \$13;

but later sales to-day were at \$12 1/2. Osceola declined to \$31 on sales of 300 shares. Kearsarge came out quiet freely at \$11, and Centennial, which has been quiet of late, sold at \$7. Allouez at \$1, Wolverine at \$2, Santa Fe at 12 1/2 c., and Arnold at \$1 1/4, complete the list. Silver stocks continue to be neglected, with an occasional sale of Catalpa at 20c. and Napa Quicksilver at \$6 1/2.

**San Francisco.** August 26.  
(From our Special Correspondent.)

For many weeks the market has been in a state of stagnation, and during the week ended August 20th the total number of shares sold in the Board amounted to only 29,770. On Thursday, August 18th, only 3,620 shares changed hands, the commissions on which would scarcely do more than pay the brokers' car fare. This week a change has taken place, and yesterday (Thursday) quite a sharp rally took place, led by Hale & Norcross, Belcher, too, was particularly strong, but the notable "Bob" Morrow, acting, it is said, under instructions from D. O. Mills, stopped the rapid advance.

At the north end of the Comstock prices have continued heavy, with sales, however, larger in volume. To-day consolidated California and Virginia sold for \$3.20; Mexican for \$1.10; Ophir for \$2.10; Sierra Nevada for \$1.30; Union Con. for \$1.05, and Utah Con. for 25c.

In the middle group of Comstocks, Hale & Norcross advanced on Thursday over 300 per cent. Opening at 45c. it advanced, under spirited trading, to 80c. Later in the day it advanced to \$1.50, with heavy sales. At the opening of the Board to-day the price sagged back, and ruled through the sessions at 95c. Savage, which sold actively at 65c., has remained steady at that figure. Best & Belcher ruled to-day at \$1.15; Chollar at 45c.; Gould & Curry at 75c., and Potosi at 45c.

Of the Gold Hill and South End Comstocks, Belcher has been by far the most prominent. Nearly 2,000 shares changed hands to-day in regular sessions alone, the ruling rate being \$1—a 10c. advance on the highest figures of last week. It is generally understood that the ore body in Belcher extends to the 400 level, and this report would have sent the price far above that quoted but for the manoeuvring tactics of Mr. Mills' henchman.

Most of these stocks, indeed, received a setback to-day but a movement having been made, and the mines all in good looking shape, it is expected that higher prices may rule along the line of Comstocks any day. Meantime Apha is quoted at 15c., Bullion at 20c., Caledonia at 20c., Challenge at 25c., Con. New York at 35c., Confidence at \$1. Crown Point at 50c., Exchequer at 5c., Overman at 30c., Seg. Belcher at 20c., Justice at 15c., Occidental at 30c. and Yellow Jacket at 50c.

In the outside group of stocks Bodie ruled at 30 cents, a trifling advance on last week's trading; Belle Isle at 5 cents, Commonwealth at 5 cents, North Commonwealth at 5 cents and Peer at 10 cents. After the call this afternoon prices fell off somewhat without much stock changing hands, the market closing steady but inactive.

**SAN FRANCISCO, Sept. 2.—(By Telegraph.)**—The opening quotations to-day were as follows: Best & Belcher, \$1.25; Bodie, 30c.; Belle Isle, 5c.; Bulwer, 25c.; Chollar, 60c.; Consolidated California & Virginia, \$3.25; Eureka Consolidated, \$2; Gould & Curry, 90c.; Hale & Norcross, 95c.; Mexican, \$1.30; Ophir, \$2.30; Savage, 75c.; Sierra Nevada, \$1.50; Union Consolidated, \$1.30; Yellow Jacket, 60c.

**ASSESSMENTS.**

COMPANY.	No.	When levied.	D't'n'g't in office.	Day of sale.	Amt per share.
Best & Belcher, Nev.	62	Aug. 17	Sept. 22	Oct. 13	.25
Bullion, Nev.	39	.....	Sept. 2	Oct. 4	.25
Challenge Con., Nev.	12	Aug. 24	Sept. 27	Oct. 18	.10
Confidence, Nev.	12	Aug. 13	Sept. 15	Oct. 6	.50
Crocker, Nev.	12	.....	Sept. 2	Oct. 18	.05
Del Monte, Nev.	6	.....	Aug. 26	Oct. 5	.10
Exchequer, Nev.	33	July 27	Aug. 31	Sept. 20	.10
Florida Hill Gravel, Idaho	4	July 27	Sept. 2	Sept. 28	.30
Gold Mountain, Cal	3	July 16	Aug. 20	Sept. 8	2.00
Gold'n Fleece Gravel, Cal.	17	July 16	Aug. 24	Sept. 20	8.00
Guasucaran & California, Hon. C. A.	7	Aug. 9	Sept. 15	Oct. 8	1.50
Hale & Norcross, Nev	102	Aug. 11	Sept. 15	Oct. 7	.50
Justice, Nev.	51	July 26	Aug. 31	Sept. 19	.10
Kentuck Con., Nev.	4	July 15	Aug. 18	Sept. 8	.10
Mountain Tunnel Gravel, Cal.	5	July 28	Sept. 5	Sept. 26	.07
Navajo, Nev.	22	Aug. 17	Sept. 21	Oct. 14	.10
North Belle Isle, Nev	2	Sept. 1	Oct. 6	Nov. 7	.10
Northwestern, B. C.	5	Aug. 17	Sept. 24	Oct. 15	.20
Peerless, Ariz.	18	July 6	Aug. 11	Sept. 7	.05
Peer, Ariz.	13	July 19	Aug. 25	Sept. 22	.10
Rainbow, S. Dak.	6	July 19	Aug. 20	Sept. 9	.00 1/2
Scorpion, Nev.	4	July 11	Aug. 19	Sept. 12	.05
Silver Hill, Nev.	31	Aug. 2	Sept. 6	Sept. 27	.05
Silver King, Ariz.	8	July 19	Aug. 27	Sept. 27	.25
Teresa, Mex.	8	Aug. 19	Sept. 22	Oct. 8	.10
Union Con., Nev.	46	July 18	Aug. 24	Sept. 13	.25
Western Star, Cal.	1	July 25	Aug. 30	Sept. 21	.02

**Meetings.**

Gold Mountain Mining Company, at the office of the company, No 325 Montgomery street, San Francisco, Cal, September 6th, at 3 P. M.  
Horn Silver Mining Company, at the office of the company at Frisco, Utah, October 4th, 12 o'clock, noon.

**DIVIDENDS.**

Charleston (S. C.) Mining and Manufacturing Company paid a dividend of three dollars per share September 1st at the office of the company, No. 132 Walnut street, Philadelphia, Pa.

Lexington Mining and Milling Company, dividend No. 9 of one cent per share, \$3,000, payable September 1st at the office of the company, No. 1624 Curtis street, Denver Colo.

Red Cloud Mining Company, of Idaho, paid August 25th, dividend No. 12 of five cents per share, aggregating \$10,000.

The total sale of Pipe Line certificates at the Consolidated Stock and Petroleum Exchange amounted to 330,000 bbls.

**COAL TRADE REVIEW.**

New York, Friday Evening, September 2.

Statement of shipments of anthracite coal (approximated) for week ending August 27th, 1892, compared with the corresponding period last year.

Regions.	Aug. 27, 1892.	Aug. 29, 1891.	Difference.
	Tons.	Tons.	
Wyoming Region....	438,490	402,974	Inc. 35,516
Lehigh Region.....	126,979	126,137	Inc. 842
Schuykill Region....	225,884	226,012	Dec. 128
Total.....	791,353	755,123	Inc. 36,230
Total for year to date	26,143,781	24,760,288	Inc. 1,383,493

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

**EASTERN AND NORTHERN SHIPMENTS.**

	1892.		1891.
	Week.	Year.	
Phila. & Erie R. R.....	490	56,014	123,635
Cumberland, Md.....	73,232	2,400,765	2,740,397
Barclay, Pa.....	2,325	123,239	122,666
Broad Top, Pa.....	10,072	380,120	329,235
Clearfield, Pa.....	68,233	2,574,659	2,625,728
Allegheny, Pa.....	26,547	827,792	845,868
Beach Creek, Pa.....	40,173	1,608,763	1,582,990
Pocahontas Flat Top.....	56,319	1,561,257	1,508,405
Kanawha, W. Va.....	59,492	1,531,954	1,528,399
Total.....	341,883	11,064,613	11,407,323

**WESTERN SHIPMENTS.**

	1892.		1891.
	Week.	Year.	
Pittsburg, Pa.....	21,533	833,730	826,740
Westmoreland, Pa.....	36,325	1,094,282	1,333,834
Monongahela, Pa.....	13,354	408,386	396,727
Total.....	71,212	2,336,398	2,557,301

Grand total..... 413,115 13,401,011 13,964,624

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending August 27th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 91,102 tons; year, 3,519,049 tons; to corresponding date in 1891, 2,576,143 tons.

**Anthracite.**

The anthracite market continues to be dull, and the increased activity expected in fall has not yet arrived. There was a temporary briskness in demand during the last three days of August, owing to the desire of retail dealers and large consumers to stock up their yards to the full before the prices are put up to the September rates. The congestion in the producers' stocking plants and in the freight cars and ships still continues, however, and generally speaking anthracite is going off only slowly. The local retail sale agents have advanced prices 25 cents a ton all round, thus making free burning coal \$5.75 and red ash \$6.25. A much greater increase was expected, but most dealers have such a large amount of coal on hand that they purchased at low prices that they did not consider it necessary to put up the prices more than 25 cents.

The Philadelphia & Reading Coal and Iron Company announce the following prices for coal in New York on and after September 1st:

	Broken.	Egg.	Stove.	Chesn't.
Hard white ash.....	\$4.10	\$4.50	\$4.75	\$4.65
Free white ash.....	4.00	4.40	4.75	4.65
Shamokin.....	4.90	4.95	4.95	4.65
Schuykill red ash.....	4.65	5.10	4.90	
Lorberrry.....	4.65	5.10	4.90	
Lvkens Valley.....	5.10	5.65	6.15	5.25

The effect of the judgment of Chancellor McGill is still causing much speculation in coal circles and nothing reliable to base prophecies on can be obtained. There appears to be a feeling in the market that the decision is bad law, although nobody who is a consumer and not a holder of Reading stock shows any inclination to help to put the law straight. There is, of course, a firm determination on the part of the barons to persevere in their course, but, as we said last week, it will be more difficult to hold together without a legal agreement.

The statement of the Philadelphia & Reading Coal and Iron Company for the month of July shows gross receipts, \$1,835,498.60; operating expenses, including improvements, \$1,727,693.32; profit from mining \$107,805.28. From this is deducted \$68,000 as one-twelfth of the current year's fixed charges, leaving a surplus of \$39,805.28, a decrease of \$3,479.09 compared with the month of July, 1891. For eight months of the current fiscal year there is a deficit of \$349,237.40, a decrease of \$392,346.12 compared with the same period of 1891.

A prominent coal operator says: "Reading's July



statement did not surprise me. The decrease of \$3,479 in the Coal and Iron Company's July revenue, as compared with July, 1891, in the face of higher coal prices this year than last, is easily explained. The Coal and Iron Company purchased in July of independent operators, including Coxe Bros. & Co., on the 40% and 60% basis, nearly a million tons of coal. This means that the tolls received by the railroad company for transportation were 40% of the July prices. These were as follows:

	Actual July selling price.	Freight on 40% basis.
Broken.....	\$3.57	\$1.428
Egg.....	3.82	1.528
Stove.....	4.02	1.63
Chestnut.....	3.89	1.556

The freight derived from this individual coal in July, 1891, was \$1.75 per ton. The average freight on the percentage base, calculating 75% of the tonnage to have been domestic sizes, was about 1.55c. per ton. The difference as compared with last year's rate is 20c. a ton, on 1,000,000 tons of coal \$200,000. Added to this fact that large amounts of coal have been stocked at an actual cost of mining and transportation and we can readily see why Reading's July statement makes so unsatisfactory a showing."

There are rumors on Wall street that the Philadelphia & Reading and New York & New England railroads have made a contract which will have a tremendous effect on transportation. No facts have yet been made public.

The Philadelphia & Reading Railroad have issued a freight tariff circular which withdraws the joint rates with the Pennsylvania Railroad for coal. The Reading Company has been trying to get the Pennsylvania into the deal and have evidently failed. No doubt the Pennsylvania will withdraw its joint rates on soft coal in retaliation. The coal war will cause a considerable upset in Eastern Pennsylvania and in the Reading's Schuylkill Valley industries.

**Bituminous.**

The demand for bituminous coal is very brisk, but unfortunately the producers cannot get a sufficiency of cars to bring their coal to market. As a matter of fact the supply of cars is better than it has been during many previous weeks, but the increase in the demand has been so great that traffic facilities are quite inadequate. There is a plentiful supply of vessels at Philadelphia, but the slowness of car deliveries causes the ocean freights to be low. From Philadelphia the freights are:

To Boston, Salem and Portland, 55@60c.; to Sound ports, 60c. From Baltimore, Newport News and Norfolk the freights are 60@65c.; to Boston, Salem and Portland, and to the Sound ports, 70c. The rates quoted from Philadelphia are extremely low, but our figures represent actual chartering. Many shippers pay 5@10 cents higher. Local trade in the city and neighborhood is excellent.

**NOTES OF THE WEEK.**

The piece of land along the line of the Pittsburg, McKeesport & Youghiogheny Railroad at Buena Vista, recently purchased by John W. Painter and Robert and Frank Carroll, contains 205 acres. Upon it will be built one of the largest coal plants along the Youghiogheny river. It is said that the new plant will be provided with all the modern improvements and coal mined and shipped with the least possible expense.

Work on the Baltimore & Harrisburg Railroad extension, a branch of the Western Maryland Railroad, is progressing satisfactorily, and has reached a point within three and a half miles of York, Pa. A large force of workmen is employed in grading the roadbed, and considerable work has already been done at various points between York and Thomasville. The completion of this branch will put in the field a powerful competitor of the Northern Central Railroad, especially if plans now under consideration are carried out. It is an old scheme that is proposed, but one that is entirely feasible, and will greatly benefit the Reading system, as it will give it a new and much shorter route to Baltimore and other Southern points. The plan is to extend the Baltimore & Harrisburg from York to a point opposite Chickies, which is about eighty-two miles west of Philadelphia. By bridging the Susquehanna River at this point, connection can be made with the Marietta & Reading, which is a branch of the Reading & Columbia, both roads being a part of the Reading system. As above stated, the plan is entirely feasible. The river at Chickies is very narrow, and is a dangerous point when the ice freshets occur in winter, as gorges are readily formed, the river making a sharp bend; but by building the piers solidly—and they would have to be considerably higher than those under the Pennsylvania Railroad bridge at Columbia to allow the formation of the junction with the Reading—all danger from ice gorges could be eliminated. Reading's coal shipments in that neighborhood are made via the Reading & Columbia Railroad to Columbia, where the coal is dumped from the cars into boats and is then taken south by way of the tidewater canal, which extends along the York County side of the Susquehanna River.

The Walbonding Valley, a Pennsylvania line, will be completed and opened for traffic in about two months. It is about 50 miles in length, connects the northwest and southwest systems of the Pennsylvania lines, and taps a very prolific coal region. Its terminal will be Loudonville and Coshocton, O.

The track on the Susquehanna Division of the Cambria & Clearfield Railroad, which is a branch

of the Pennsylvania, will reach the new town of Spangler, situated on the East Port of the Susquehanna River, about eight miles north of Carrollton, early in September. At this point are grouped seven or eight openings for the mining of bituminous coal on the "D" vein, which at this point is found upward of four feet in thickness and mines a superior quality of coking coal. The progress of Spangler has been quite exceptional and it owes its life entirely to the conjunction of railroad facilities with valuable coal deposits. This is only one of the new towns which the extension of the Cambria & Clearfield will build up; others are already located. The extensions, when completed, will form a loop and the property within it, when developed, will be most valuable because of the fine quality of soft coal it is known to contain.

**Boston.** September 1.

(From our Special Correspondent.)

This has been a dull week in the coal trade. This is no more than natural considering the light demand. There has consequently been no perceptible diminution in stock, for if there had been the retailers would have been only too eager to avail themselves of the opportunity to secure stocks before the new prices went into effect. The new prices, of course, went into effect to-day.

Circular prices are stove \$4.57; egg \$4.50; chestnut \$4.65; broken \$4.10.

Trade in bituminous coal is fully as quiet as when last reported. Dealers seem to have as much of this stock on hand as they need. If dealers had any room for coal last week they would not have filled the vacancy with bituminous, anyway with the chances they had for buying anthracite. Soft coal, however, is quite sure to advance this month or next, and present purchasers will not go astray. Clearfield on cars here is worth \$3.15, George's Creek \$3.45@3.50 per ton.

There is practically nothing new to state in connection with freight rates. There is not much call for vessels now, consequently rates are low. Rates are as follows: From New York, 65@70c.; from Philadelphia, 70@75c.; from Baltimore, 90c.@\$1.

In a retail way there is probably less doing than there was a week ago. Without being forewarned, the retail dealers of this city suddenly advanced prices on coal 25c. per ton all around a few hours after the wholesale advance was made. Consumers know that these prices will remain as they now are for a month at least, and, consequently, are in no hurry to buy. Boston retail prices are: Stove, \$6.25; nut, \$6.25; egg, \$6; furnace, \$5.75; Franklin, \$7.50; Lehigh egg, \$6.25; Lehigh furnace, \$6.25. Wharf prices 50c. less than the foregoing.

The receipts of coal at the port of Boston for the week ending Aug. 27 were: 29,601 tons of anthracite and 15,389 tons of bituminous against 32,571 tons of anthracite and 18,297 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 1,377,863 tons of anthracite and 517,852 tons of bituminous against 1,303,457 tons of anthracite and 703,773 tons of bituminous for the same time last year.

**Buffalo.** September 1.

(From our Special Correspondent.)

The anthracite coal circular for September 1st is published. The following are the prices until further notice: Free on board vessels, Buffalo, per 2,240 lbs.: Grate, \$5.35; egg, stove and chestnut, \$5.60. On cars, Buffalo and Suspension Bridge, per 2,240 lbs.: Grate, \$5.05; egg, stove and chestnut, \$5.30. Retail: 2,000 lbs., screened and delivered: Grate, \$5.50; egg, stove and chestnut, \$5.75; pea, \$4.25.

The quotations for bituminous coal are nominally unchanged; the strike being over, the business is nearly back to its normal condition, as cars are either coming in or expected every hour.

The coal trade is generally dull; consumers are grumbling very much at the advance in the price of anthracite, and many are using or will use soft coal or coke as a substitute.

The Buffalo extension of the Philadelphia & Reading Road was opened this morning for passenger and freight traffic.

The Canadian propeller "Rosedale" was to leave this port coal laden for Fort William; through delay in loading in consequence of the strikes, it was found that it would be impossible for her to reach the Sault Ste. Marie Canal before September 1st to avoid the heavy tolls, she therefore steamed away light and lost her up freight.

Lake shipments of coal have been very light during the past week again in consequence of the limited receipts resulting from the demoralization of railroad traffic through the strike. The shipments of coal westward by lake from August 24th to 31st, both days inclusive, aggregated only 36,994 net tons, distributed about as follows: 13,050 to Chicago, 9,950 to Milwaukee, 600 to Duluth, 625 to Kenosha, 500 to Oscoda, 2,755 to Toledo, 4,200 to Superior, 200 to Bay City, 300 to Detroit, 350 to Saginaw, 600 to Port Huron, 1,800 to Ft. William, 350 to Marine City, 650 to Green Bay and 650 to Sault Ste. Marie. The going rates of freight were 55c. to Chicago, Green Bay and Milwaukee; 70c. to Kenosha; 45c. to Marquette; 50c. to Portage, Oscoda and Sault Ste. Marie; 35c. to Duluth, Superior, Marine City and Port Huron; 35c. to Bay City; 25c. to Amherstberg, Detroit and Toledo, and 40c. to Saginaw and Ft. William. A large majority of vessels leaving were "light." At the close coal was beginning to be more plentiful and the demand for charters increasing.

The canal report for the fourth week in August

shows the receipts at this port to be 4,212 net tons and the shipments 683 net tons.

**Chicago.** Sept. 1.  
(From our Special Correspondent.)

The advance of 25 cents which went into effect to-day has greatly stimulated the demand for anthracite, both wholesale and retail. Shippers state that they have had more business than they could attend to properly, and a good deal of it has been rushed through without due consideration. Orders have been and are larger than for weeks past, and many country dealers by their tardiness in leaving things to the last few days of August will have to pay the advance, as sales are subject to circular price in force at the time of shipment without regard to the date on which orders are entered. Missouri River trade is generally holding off in expectation of lower freight rates and a slump in prices. A large amount of eastern anthracite tonnage will be displaced this year by Colorado and other hard coal mined in those regions. Shippers here believe that thin grades of coal will be substituted for anthracite at many of the Missouri River points. The Buffalo strike has seriously affected receipts of all-rail and Lake coal, and despite the fact that the strike has been settled, receipts are still limited and shippers are complaining that they could advantageously use considerably more if they had it now. They also complain of scarcity of cars east for western shipment. Orders have been peremptorily refused early in the week at August prices, shippers knowing they could not start the coal on its way before or by the end of the month. The retail trade has never been more active in the city of Chicago than during the past few days. The public realizes that this anthracite combination has come to stay, and dealers, who for the past three months have been advising their customers to hold off, are receiving more or less of reproaches. All the large down town offices have been besieged, and great efforts have been made to get "under cover" at August rates. The larger trade and jobbers outside of the regular shippers' agents feel that they are being unfairly treated, from the fact that the Lincoln Park contract for about 1,500 tons, to be delivered during the year, was awarded Aug. 30, on bids made in July. These were \$5.95 for grate and \$6.50 for the smaller sizes, delivered as required during the entire season. The contract was awarded to a concern outside the consolidated companies, and the wide discrepancy between the contract prices and the price to consumers excites a more bitter feeling against the combination than has heretofore existed. It seems to us that prices should be equalized between the different classes of trade. That some of the dealers are more honorable is shown in the fact that in the writer's presence yesterday an order was refused for 300 tons at \$7. Of this 150 tons was to be delivered next week and 150 tons to employees of one of the large corporations of the city.

Bituminous coal is in fair demand, and but little more than the actual tonnage required is being mined. Some operators declare their inability to fill orders promptly on account of scarcity of cars, particularly in Indiana and Ohio regions. Northern Illinois coal is in moderate demand, and the car service none too good. There is every reason to believe that circular price on all grades of bituminous coal will mean more than mere figures to be shaded or cut and slashed as the dealer sees fit to demand. The expense of marketing this product now greatly exceeds the saving which has been effected by scientific mining and labor-saving machinery, and mine owners insist on the circular being maintained. Indiana block coal is in good demand, and the price has been advanced 15 cents—\$1.35@1.50 at mine, equal to \$2.50 on track, Chicago. The outlook for the soft coal branch of the trade is very flattering, and September's business will be large.

Coke continues in light demand, but consumption is quietly but steadily increasing as foundries become more actively employed. Crushed domestic is in fair demand.

Quotations are: \$4.65 furnace; \$5.05 foundry crushed; \$5.40 Connellsville; West Virginia, \$3.90 furnace, \$4.10 foundry; New River foundry, \$4.75; Walston, \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.50; large egg, \$5.85; small egg, range and chestnut, \$6.10. Retail prices per ton are: Large egg, \$7.25; small egg, range and chestnut, \$7.25.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.15; Hocking Valley, \$3; Youghiogheny, \$3.25; Illinois block, \$1.90@2; Brazil block, \$2.50.

**Pittsburg.** Sept. 1.

(From our Special Correspondent.)

**Coal.**—There is nothing very special to note. The operators have held several meetings with closed doors, refusing to make known their deliberations. That a reduction for mining will be demanded is beyond doubt. In view of this secrecy it may be fair to presume that the river operators will insist on the half cent cut in mining wages. They are of the opinion, however, that their decision if announced at this time would be premature. If the operators conclude to adopt this course some 9,000 or 10,000 men will be affected, and if they refuse to submit to the reduction another strike on a large scale will take place.

Mr. O'Neil, a large dealer, was not prepared to make any statement further than this: "If they all thought as I do," said he, "they would either get a reduction or go out of the business." The coal outlook at Cincinnati is gloomy at the present time;



while there is plenty of coal on hand for the present, serious inroads are being made upon it by householders laying in their winter supply. September is a very uncertain month; unless a rise comes soon, a further advance is predicted. Some parties are of the opinion that there will be no rise before the last of October.

**Connellsville Coke.**—During the week coke production increased a little since our last; but, while there is no indication of a rise, there is a glimmering sign of better times for the region. There is no doubt but that the depth of depression has been reached, and a more hopeful feeling will arise. These observations are based on the facts of the blowing in of several furnaces, and the partial settlement of the scale.

The Frick Coke Company made a six days' run at five of its plants, while the balance of its ovens in active operation at its other plants made five days. The same company have fired a number of cold ovens. The McClure company made a four days' run at its eight active plants. Week's shipments aggregated 93,726 tons; previous week, 93,636 tons; increase, 90 tons. Week's shipment to Pittsburg, 1,400 cars; east of Pittsburg, 1,139 cars; west of Pittsburg, 2,668 cars; total, 5,207 cars. Western shipments increased 116 cars; eastern decreased 129 cars; Pittsburg shipments decreased 100 cars. Prices are unchanged.

**METAL MARKET.**

NEW YORK, Friday Evening, Sept. 2, 1892.  
Prices of Silver Per Ounce Troy.

Aug.	Sterling Exchange.	London, Pence.	N. Y. Cents.	Value of \$1. in \$1.	Aug.	Sterling Exchange.	London, Pence.	N. Y. Cents.	Value of \$1. in \$1.
27	187 1/2	38 1/4	83 1/4	64 1/4	30	187 3/4	38 1/2	83 1/2	64 1/2
29	187 1/2	38 1/4	83 1/4	64 1/4	29	187 1/2	38 1/4	83 1/4	64 1/4
30	187 1/2	38	83 1/4	64 1/4	28	188	38 1/2	83 1/2	64 1/2

\* Septen. ber.

The London market has been characterized by steadiness and absorption of silver offering from this side at current prices, nearly one million ounces being shipped this week. The government commences its monthly purchases to day, which ought to strengthen the market.

There were sold during the week ending Friday, September 2, 177,000 ounces in silver bullion certificates at from 83 1/4 to 83 cents per ounce.

**Government Silver Purchases.**

The Government has purchased during the week the following quantities of fine silver at the accompanying prices per fine ounce:  
September 2nd, 315,000 oz. at 83.64 to 83.65.

**Coinage at the Mints of the United States.**

The following statement shows the coinage at the Mints of the United States during August:

Denomination.	Pieces.	Value.
Double eagle ..	167,000	\$2,140,000
Eagle ..	49,180	491,000
Half eagle ..	190,000	951,000
<b>Total gold ..</b>	<b>346,180</b>	<b>\$3,581,000</b>
Standard dollars ..	550,000	550,000
Half-dollars ..	101,410	50,720
Quarter-dollars ..	568,000	142,000
Dimes ..	370,000	37,000
<b>Total silver ..</b>	<b>1,589,410</b>	<b>\$779,720</b>
Five cents ..	381,000	19,200
One cent ..	4,630,000	46,300
<b>Total minor ..</b>	<b>5,014,000</b>	<b>\$65,500</b>
<b>Total coinage ..</b>	<b>6,949,620</b>	<b>\$4,427,020</b>

**Gold and Silver Exports and Imports at New York for Week Ending August 27th, 1892, and for Years from January 1st, 1892, 1891.**

	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
Week ..	\$1,526,000	\$8,596	\$636,875	\$3,317	\$2,151,052
1892 ..	55,355,333	6,428,810	14,248,135	1,340,880	61,833,808
1891 ..	75,218,910	3,007,805	10,116,582	1,387,377	80,973,341

**NOTES OF THE WEEK.**

Secretary of the Treasury Foster has recently renewed the proposition to hold the International Silver Conference in London, but it is reported that the English Chancellor is opposed to it on account of the feeling in that city against bimetalism.

It is said that the American delegates will be summoned to Washington, to hold a conference with President Harrison as to their position in the conference as well as the method of work. Formal written instructions will then be given.

The feeling continues abroad that the conference will accomplish little of importance, but we do not accept this as well founded. Mr. Ottomar Haupt, a well known writer on the subject, says that the only way in which the conference can accomplish anything must be by seeking to limit by international agreement the production of silver. As the production of any article of commerce, silver and gold included, cannot legally be restricted in this country, such a proposition is impracticable.

Dr. Soetbeer, whose monetary scheme we mentioned some time ago, says that bimetalism is dead, and that no European government would join in a conference whose sole object was to discuss bimetalism. This view is reasonable in view of the fact that England has long been opposed to bimetalism, that the Latin Union has practically stopped coining silver, and that Austria-Hungary has lately endeavored to place her finances on a gold basis.

Mr. Matthew Marshall, in a recent discussion of Dr. Soetbeer's scheme, says: "The more the subject is considered, the plainer it becomes that the career of silver as a precious metal is approaching its end."

During the week ending Sept. 3 the exports and imports, so far as ascertained, have been as follows: Exports, gold, \$1,110,000; silver, \$821,273. Imports, gold, \$16,067; silver, \$123,062. All of the gold went to France; the greater part of the silver to England.

**Domestic and Foreign Coin.**

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

	Bid.	Asked
Mexican dollars ..	.66	.67
Peruvian soles and Chilean pesos ..	.61	.63
Victoria sovereigns ..	4.86	4.90
Twenty francs ..	3.86	3.90
Twenty marks ..	4.74	4.78
Spanish 25 pesetas ..	4.79	4.81

**Copper.**—As foreshadowed in our last issues, the tendency is outspoken toward lower prices, for though the big companies have not yet met buyers views of 11 1/2%, the offerings from the smaller companies and second hands have been sufficient to bring about prevailing conditions, and though sales would be freely made at 11 1/2%, manufacturers are well satisfied to wait, though they have not much in the way of stocks. The same remark may apply to the orders on their books, as also to the prospects for improvement in business, which is said to be very slow at present. One mistake the Lake companies have apparently made is in underestimating and overlooking the importance of the production of electrolytic copper, which, as we have heretofore noted, is increasing daily, and has been the only thing that enabled manufacturers to buy so meagerly from the Lake companies, for it is the production of the latter that is displaced by this comparatively new commodity. Other kinds of copper have not suffered so much in prices, casting still being nominally quoted at 10% delivered thirty days, while Arizona pig copper can now be had at 9 1/2%. The market in London has been quite steady during this week as last, opening at £44 5s. @ 7s. 6d. for spot and £44 15s @ 17s. 6d. for futures, and closing at £44 7s. 6d. @ 10s. for the former and £44 15s @ 17s. 6d. for the latter. During the last half of August statistics showed a decrease of 2,100 tons, which sufficiently offset the increase of supplies in the first half of the month to make the figures of August 31st tally closely with those of a month previous. This at first caused a little firmer feeling, which did not last long. Manufactured sorts are unchanged. English tough, at £46 @ £46 5s.; best selected at £47 15s. @ £48 5s.; strong sheets at £52 15s. @ £53; India sheets at £50 @ £50 10s.; yellow metal sheets at 5d.

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

To	Copper Matte.	Lbs.	Value.
To Liverpool—			
S. S. Pedro ..	905 bags	86,610	\$4,300
S. S. Tauric ..	1,807 "	193,370	10,600
To Liverpool—			
S. S. Pedro ..	2,005 bars	200,190	\$24,023
Hamburg—			
S. S. Dania ..	Copper.	Lbs.	
	9 pkgs.	1,008	\$116
To Havre—			
S. S. La Bretagne ..	Copper.	Lbs.	
	58 casks	71,750	\$7,900
To Rotterdam—			
S. S. Amsterdam ..	Copper.	Lbs.	
	816 pigs	224,094	\$26,000

Tin has been quiet, as is usual when the fluctuations are slight. The week opened with business doing at 20 40 and closes at 20 35 for spot and September, and 20 50 for the later months of the year. The bulk of business, however, has been done for early delivery, or for delivery at any time during the rest of the year at seller's option, at 20 30, at which there are buyers over. The London market opened on Monday at £93 2s. 6d. @ 5s. for all deliveries and closed at £93 2s. 6d., having fluctuated no more than that here. A decrease in available supplies of 100 tons is reported.

Lead has continued to be quite steady at the improved figures and is likely to for some time, as on the one hand consumption is somewhat better, as is usual at this season of the year, and, on the other, there is a continued scarcity of raw material, consequently a shortage in the output of bullion, which is felt more or less by all the refiners, who are very reluctant sellers except at their own figures of 4 20 @ 25, which cannot be realized, as second hands and the smaller refineries are able to fill the demand at 4 15 @ 17 1/2, the former being the closing quotation. Owing to the reported early settlement of the strike at Broken Hill mines, there is a weakness abroad shown in the decline of Spanish lead to £10 2s. 6d. and of English to £10 5s., though we do not think prices will suffer much, as they did not profit a great deal when the strike first broke out and everyone expected a curtailment of supplies, which will now probably not be felt. Consumption on the other side is likely to be better now, the same as here.

The Post Boynton Strong Company telegraph us as follows: "The market shows signs of improvement. Sales amount to 200 tons at 4c. The demand is increasing with 4 05c. asked at the closing."

Spelter is still declining, galvanizers having changed their tactics and now pursuing the policy of buying for half-a-month wants only. Consequently orders are all eagerly competed for, and some have been booked at 4 1/2 @ 4 40c. east of St. Louis, with more metal obtainable at the same figures. The market abroad also shows a decline, the present quotation for good ordinaries being £20 13s, 9d. and for specials £20 16s, 3d.

Antimony is a little easier. Cookson's at 10c., L. X. at 11 1/2c. and Hallet's at 10 1/2c. Nickel we still quote at 60c.

**IRON MARKET REVIEW.**

NEW YORK, Friday Evening, Sept. 2, 1892.

**Pig Iron Production.**—The following table gives the number of furnaces in blast, and the estimated production of pig iron in the United States, during the week ending Saturday, August 29th, 1891, and for the corresponding week ending August 27th, 1892. Also the total estimated production from January 1st of last year to these dates. This table has been corrected by the official returns of the American Iron and Steel Association for the first six months of each year. The figures are in gross tons.

Fuel used.	Week ending—				From Jan., '91.	From Jan., '92.
	Aug. 29, '91.		Aug. 27, '92.			
	F'cs.	Tons.	F'cs.	Tons.	Tons.	Tons.
Anthracite ..	91	36,434	68	29,000	1,238,569	1,186,365
Coke ..	165	134,151	132	118,100	3,311,864	4,609,875
Charcoal ..	54	11,120	40	8,200	354,007	359,081
<b>Total ..</b>	<b>313</b>	<b>181,705</b>	<b>240</b>	<b>155,300</b>	<b>4,934,440</b>	<b>6,155,321</b>

There is no change discernible in the state of the pig iron market here. Consumers refuse to purchase more than a month's supply at a time for prompt delivery, and many of them run themselves down very low in the matter of stocks at the end of each month. Consumers have a firm conviction that prices will go lower, but producers have no difficulty at present in obtaining prices. The production is still decreasing. There is a slightly improved demand compared with a month ago, but the consumption is not anywhere near so great as it should be at the commencement of fall. The accumulated stocks will be quite sufficient to meet whatever slight increase in the demand there is without it being necessary to increase the production.

The production of Bessemer pig is reported as still increasing, and its use in the manufacture of billets is growing. The death of Mr. B. G. Clarke, president of the Thomas Iron Company, which we reported a fortnight ago, will not be the cause of any change of policy on the part of the directors of that company. They will continue to follow the market instead of leading it. In all probability Mr. E. C. Knight will succeed to the presidency, and that in future the company will only have a selling agent here instead of having its headquarters here. The prices of Northern brands are: No. 1, \$15; No. 2, \$14; grey forge, \$13 @ \$13.50, at tidewater. The market here for Southern pig iron is lifeless, and very little is being done in grey forge.

**Spiegel-eisen & Ferromanganese.**—No transactions in spiegeleisen are reported. The demand for ferromanganese is small at present and no sales of any importance have taken place. The price remains at about \$58 per ton.

**Steel Rails.**—The only new business received during the week at Eastern mills is an order for 10,000 tons of steel rails. Otherwise the market is featureless. The Pennsylvania Railroad have been favorably impressed with the 100-lb. rail since they gave the experimental order some months ago, and they are considering the advisability of adopting it as their standard in place of the 90-lb. rail which they employ at present. Probably in the future all their orders for new rails for their chief lines will be for 100-lb. rails. Prices continue at \$30 per ton at mill.

**Rail Fastenings.**—The demand for rail fastenings is very light, and little business has been transacted lately. The prices are as follows: Fish and angle plates, 1 55 @ 1 65c., at mill; spikes, 1 90 @ 2c.; bolts and square nuts, 2 50 @ 2 70c.; hexagonal nuts, 2 70 @ 2 80c., delivered.

**Merchant Iron and Steel.**—The demand for all kinds of merchant iron and steel continues regular, but is not of large proportions. There is no variation in prices, which stand as follows: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6 1/2 @ 7 1/2c.; special grades, 13 @ 18c.; crucible machinery steel, 4 75c.; crucible spring, 3 75c.; open hearth machinery, 2 2c.; open hearth spring, 2 50c.; tire steel, 2 25c.; toecalks, 2 25 @ 2 50c.; first quality sheet, 10c.; second quality sheet, 8c.

**Structural Material.**—The great demand for structural material is the feature of the iron trade at present. The eastern mills are all overcrowded with work, and they will be kept fully occupied on present orders for months. Deliveries are consequently slow and prices stiff. The number of orders received during the last week is not so great as in previous weeks, but the manufacturers are glad if anything of the lull, as they believe it is only temporary. Prices stand about as follows: Beams, 2 3 @ 2 5c., except for 20 inch beams, which are 2 8c.; angles, 2 15c.; sheared plates, 2 @ 2 10c.; tees, 2 40 @ 2 60c.; channels, 2 35 @ 2 50c.; universal plates, 2 @ 2 10c.; bridge plates, 2 @ 2 10c.; all on dock.



**Buffalo.** September 1.

(Special report by Rogers, Brown & Co.)

The market has shown considerably more activity during the past few days. The demand reaches over a wide area and in a few instances lots of five hundred tons and one thousand tons have been placed, besides quite a large business made of fifty or one hundred tons here and there. Consumption is unquestionably increasing. Prices are no higher with an excess of iron being offered, although evidently drawn from stocks. We quote for cash f. o. b. cars Buffalo: No. 1 X Foundry Strong Coke Iron Lake Superior ore, \$15.25; No. 2 X Foundry Strong Coke Iron Lake Superior ore, \$14.25; Ohio Strong Softener No. 1, \$15.25; Ohio Strong Softener No. 2, \$14.25; Jackson County Silvery No. 1, \$17.30; Jackson County Silvery No. 2, \$16.80; Lake Superior Charcoal, \$16.50; Tennessee Charcoal, \$17; Southern Soft No. 1, \$14.15; Alabama Car Wheel, \$19; Hanging Rock Charcoal, \$20.50.

**Chicago.** September 1

As an evidence of the increased confidence of the public in the establishment of large industrial plants, a big railway supply concern—the United States Rolling Stock Company which went under last year is about to be revived. The Company has been reorganized, more capital has been subscribed, and within the month the works at Hege-wisch, on the Calumet River, will be started up with a force of 600 men. Evidences are not wanting of an improved demand from railroads for equipment, rolling stock and motive power. All the car works in this district are well filled with orders, and railroad car repair shops are full of work; many of them are working overtime. This, together with miscellaneous inquiry and demand for iron and steel, assures the rolling mills ample employment for some months. Finished iron and steel of every description is in good demand and a good share of it is for prompt shipment. On account of the accumulated orders plate mills are recovering very slowly and those which have resumed are hooked full until October. Crude iron, though in fair demand, is as yet unaffected by the general air of activity and apparent prosperity surrounding the manufactured material.

**Pig Iron.**—So far as regards prices the situation is rather mixed. Some agents and furnace men are of opinion that, with the resumption of mills and the evident increased activity of our large consumers, combined with the usual fall activity, there may be some improvement in values a little later. Others believe that the same dead level of low prices will continue for some time. Probably the most encouraging feature is the active demand for iron and steel, and in its continuance lies the hope for the future. Another hopeful feature is the increased demand by foundries for molders; some foundrymen, on account of the scarcity, are advertising in outside towns for mechanics. The figures at which some of the business has been taken for local coke iron would indicate a lack of intelligence, as there is every evidence that the market is on the eve of improvement. Orders, though small, are more frequent, and it is still hard work to sell iron, reasonable offering being refused. Lake Superior charcoal iron is *in statu quo* so far as regards new business, but prices are firm. Southern iron is in moderate demand and prices as low as ever.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$16.55@17.00; Lake Superior coke, No. 1, \$14.50@15; No. 2, \$14@14.25; No. 3, \$13.75@14; Lake Superior Bessemer, \$16.50; Lake Superior Scotch, \$15.50@16; American Scotch, \$16.75@17.75; Southern coke, foundry No. 1, \$14.50; No. 2, \$13.25; No. 3, \$12.50; Southern coke, soft, No. 1, \$13.25; No. 2, \$12.50; Ohio silveries, No. 1, \$17; No. 2, \$16.50; Ohio strong softeners, No. 1, \$17; No. 2, \$16.50; Tennessee charcoal, No. 1, \$17; No. 2, \$16.50; Southern standard car wheel, \$20@21.

**Steel Billets and Rods.**—Billets are in little demand, and several large sales were made this week at \$24.50. Rods are also in good inquiry at \$34.50.

**Structural Iron and Steel.**—Several important buildings have been refused consideration by contractors, as it would be impossible to have them finished by specified time, May 1, 1893. This was due to inability to obtain the steel shapes required. Demand is still fair but is tapering off. Regular quotations, car lots f. o. b. Chicago, are as follows: Angles, \$2@2.25; tees, \$2.30@2.40; universal plates, \$1.95@2; sheared plates, \$1.95@2; beams and channels, \$2.25@2.50.

**Plates.**—The continued scarcity of plates and heavy sheets makes store business very active at remunerative prices. Some large mill orders were closed during the week. Steel sheets, 10 to 14, \$2.30@2.40; iron sheets, 10 to 14, \$2.20@2.30; tank iron or steel, \$2.10@2.15; shell iron or steel, \$2.75@3; firebox steel, \$4.25@5.50; flange steel, \$2.75@3.00; boiler rivets, \$4.00@4.15; boiler tubes, 2 1/2 in. and smaller, 60%; 7 in. and upward, 70%.

**Merchant Steel.**—Is in fair demand from dealers and consumers. Prices have held their own during August with a few slight advances on some specialties. Tool steel continues in good demand. We quote tool steel, \$6.50@6.75 and upward; tire steel, \$2.10@2.20; toe calk, \$2.40@2.50; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.75@1.90; open hearth machinery, \$2.40@2.60; open hearth carriage spring, \$2.25@2.30; crucible spring, \$3.75@4.

**Galvanized Sheet Iron.**—Despite the active demand from warehouse and mill, prices are trending

downward and discounts easy at 70 and 10% off on mill lots, and 70% on Juniata, and 70 and 5% off on charcoal from warehouse.

**Black Sheet Iron.**—Demand is well sustained, and some mills are unable to make deliveries on new business until October. Quotations remain steady at 2-90@2-95c. for No. 27 Common, f. o. b. Chicago. Steel sheets are 10c. higher. Dealers quote 3-10@3-20 from stock, same gauge.

**Bar Iron.**—There is considerable business offering and the demand is active for prompt shipment. Some mills positively decline to make any promises for delivery of material before the end of October. Mills in a position to take orders covering delivery during September and following month have no difficulty in getting 1-52 1/2@1-55c. at mill, equal to 1-65@1-67 1/2c. at Chicago. Jobbers quote 1-90c. from stock and the demand is good.

**Nails.**—Steel cut are in better inquiry from factory at \$1.60@1.62 1/2, 30c. average, and \$1.70@1.75 from stock in small lots. Wire nails are also in good demand from mill and sales of 1,000 to 3,000 keg lots are frequent at \$1.70@1.72 1/2, and \$1.85 from stock.

**Steel Rails.**—There is quite a number of small lots of light weight steel rails for lumbering purposes to be placed soon. We hear of no large lots of heavy sections, but carload orders are frequent from Eastern mills at \$32.75. Repair material in 10 to 15 ton lots is moving quite freely at \$1.70 for iron or steel splice bars; spikes, \$2.05@2.15 per 100 lbs.; track bolts, hexagonal nuts, \$2.65; square, \$2.55.

**Scrap.**—There is not a favorable feature to be noted. Sales are light and stocks in dealers' hands accumulating. Quotations are nominal: No. 1 railroad, \$15; No. 1 forge, \$14; No. 1 mill, \$9.50; fish plates, \$17; axles, \$19; horseshoes, \$15.50; pipes and flues, \$7; cast borings, \$5.50; wrought turnings, \$8; axle turnings, \$9.50; machinery castings, \$10; stove plates, \$8.50; mixed steel, \$10.60; coil steel, \$14; leaf steel, \$15; tires, \$14.50.

**Old Material.**—Iron rails are in better inquiry and holdings are light. Consumers would pay \$17.75, but dealers ask \$18.25, and firm at those figures. A sale of 500 tons of old steel rails under 5 ft. is quoted \$12.50, and 500 tons, selected, at \$14. Old wheels are dull at \$14.50@14.75.

**Louisville.** August 27.

(Special Report by Hall Brothers & Co.)

Quietness has been the ruling feature of the week. Prices have reached the lowest yet recorded, mostly for early delivery contracts. Individual sales have not been large, and the outlook is not favorable for any advance in price.

**Hot Blast Foundry Irons.**—Southern coke No. 1, \$13@13.50; Southern coke No. 2, \$12.25@12.50; Southern coke No. 3, \$11.75@12; Southern charcoal No. 1, \$16@17; Southern charcoal No. 2, \$15.00@15.50.

**Forge Irons.**—Neutral coke, \$11.50@12.00; cold short, \$11.25@11.50; mottled, \$10.75@11.

**Car Wheel and Malleable Irons.**—Southern (standard brands), \$20@21; Southern (other brands), \$18.50@19.50; Lake Superior, \$19.50@20.50.

**Philadelphia.** Sept. 1.

(From our Special Correspondent.)

**Pig Iron.**—Larger transactions in forge irons have been closed this week because of the full time being made in all the mills. Five hundred-ton lots to-day brought \$13. Foundry irons are quiet at \$15 and \$14 respectively for 1 and 2. There is an improving feeling in the market.

**Muck Bars.**—An enlarged demand has helped to keep prices at manufacturers' terms.

**Billets.**—No change in volume of business or prices, but inquiries are indicative of a heavier demand at \$24.75@26.

**Merchant Iron.**—An abundance of orders at 1-65 @1-75.

**Nails.**—Stocks increased this week at mills. Prices steady.

**Skelp.**—A quiet market and no change in prices.

**Pipe.**—Small orders only and at very unsatisfactory prices.

**Sheet Iron.**—A great deal of fall and early winter business has accumulated at the mills and no further concessions from card rates have been made. Galvanized continues very active.

**Plate and Tank.**—The steady run of small orders continues at full card rates for all kinds up to fire-box.

**Structural Material.**—The mills are accumulating business in both small and large orders at strong prices. Beams are \$2.35.

**Steel Rails.**—The peculiarity of business just now is the number of unimportant orders. Quotations, \$30.

**Iron Rails.**—Prices have been crowded down 25 to 50c.

**Scrap.**—Buyers take hold rather slowly at \$17.

**Pittsburg.** Sept. 2.

(From our Special Correspondent.)

**Raw Iron and Steel.**—The demand for certain kinds of raw material is slowly but steadily increasing, notwithstanding the fact that the labor troubles are not all adjusted, there being certain parts of the sale that fail to give satisfaction. The fact is, beyond all dispute, that the Amalgamated Scale is a

very complicated affair and requires considerable time to understand its details.

The first of September is at hand and several mills have not signed the scale; this shows a decided dissatisfaction with the general provisions of this year's scale. Concessions have been made in several instances and it is still claimed that others will have to be made before certain mills do the signing. It is claimed that discrimination has in some instances been made.

In conversation with a valley furnace owner he said that the present prices of pig iron barely covered the cost (his furnaces are in operation); that his firm was not offering to sell at present figures; that coke and iron ore are selling at too high a rate compared with the price of raw iron. The increased number of inquiries from buyers of raw iron, however, indicate greater confidence in the future course of the market.

Naturally enough, during the uninterrupted decline in prices during the past six months, consumers, generally, have been unwilling to purchase heavily in advance of their actual wants; consequently stocks in consumers' yards are low, and, although there is plenty of iron at the furnaces, a more active buying will in a short time absorb a large part of this accumulation and pave the way for an improvement in prices.

Even now there is a scarcity of some lines of standard brands, and leading furnaces are refusing to consider orders at present prices for the late delivery. This is true not only of the better grades of crude material, but it is also noticeable in certain forms of finished products. As an evidence of the improved feeling a large furnace owner, who, up to the last ten days, has been selling blocks of 2,000 to 4,000 tons Bessemer and mill iron, remarked: "We don't propose to sell any more iron at present prices."

A leading Eastern dealer has this to say: "As far as the markets are concerned there is as yet but little change to note in the iron and steel trade, and accounts from other sections are a combination of good, bad and indifferent. While the unfavorable influence of labor troubles has moderated in some lines, outbreaks elsewhere have operated more or less adversely, and, pending a more settled condition of affairs, both buyers and sellers adhere closely to conservative measures. Hence a sluggish condition of trade and some irregularity in values, yet there are no decided fluctuations, nor is there any visible evidence of new influence thus far from the reduction in output of mills and furnaces that has taken place in some sections."

The demand for raw material is steadily increasing; sales being liberal, including a block of 10,000 tons besides others of large size. Prices, however, show no improvement, Shoneberger's mill signed the scale. The men quit without giving the firm a minutes' notice. The mill is now running non-union.

**Coke Smelted Lake and Native Ores.**

10,000 Tons Bessemer, at Valley Furnace, Sept. Oct., Nov.	\$13.25 cash.
3,500 Tons Bessemer, Oct., Nov.	11.00 cash.
3,000 Tons Bessemer, Fall Delivery	14.00 cash.
1,000 Tons Grey Forge	12.50 cash.
1,000 Tons Grey Forge	12.60 cash.
1,000 Tons Grey Forge	12.55 cash.
1,000 Tons No. 1 Mill at City Furnace	12.50 cash.
1,000 Tons Bessemer	13.90 cash.
1,000 Tons Grey Forge	12.50 cash.
700 Tons Grey Forge	12.55 cash.
500 Tons Grey Forge	12.50 cash.
500 Tons Grey Forge	12.50 cash.
500 Tons Mill Iron	12.50 cash.
350 Tons Grey Forge	12.75 cash.
300 Tons Grey Forge	12.50 cash.
100 Tons Grey Forge	12.70 cash.
100 Tons Grey Forge	12.75 cash.
100 Tons Silvery No. 1	15.50 cash.
100 Tons No. 1 Foundry	14.50 cash.
100 Tons No. 2 Foundry	12.50 cash.

**Steel Slabs and Billets.**

2,000 Tons Billets and Slabs, Sept. to Jan.	24.00 cash.
1,500 Tons Billets and Slabs, Sept., Oct.	24.00 cash.
700 Tons Billets, prompt	24.00 cash.
500 Tons Billets, prompt	25.00 cash.
500 Tons Billets, Sept., Oct., at mill	23.75 cash.
300 Tons Billets, prompt	24.50 cash.

**Muck Bar.**

2,000 Tons Neutral, Sept. to Jan.	25.00 cash.
500 Tons Neutral, Sept.	24.80 cash.
250 Tons Neutral, Sept.	25.00 cash.

**Charcoal.**

125 Tons No. 1 Foundry	20.00 cash.
100 Tons Cold Blast	26.50 cash.
100 Tons No. 2 Foundry	19.00 cash.
50 Tons No. 3 Foundry	19.00 cash.
50 Tons Cold Blast	26.00 cash.

**Skelp Steel.**

1,200 Tons Wide Grooved	1.47 1/4 4 m.
250 Tons Wide Grooved	1.50 4 m.

**Steel Wire Rods.**

500 Tons American Fires, at Mill	32.00 cash.
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**Skelp Iron.**

500 Tons Sheared	1.85 4m
300 Tons Narrow Grooved	1.62 1/2 4m
250 Tons Wide Grooved	1.60 4m

**Billet and Bloom Ends.**

500 Tons Billet and Bloom Ends	15.50 cash.
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**Sheet Bars.**

2,000 Tons Sheet Bars, prompt	30.00 cash.
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**Old Iron and Steel Rails.**

500 Tons Old Iron Rails	19.50 cash.
500 Tons Old Steel Rails	15.60 cash.
500 Tons Old Iron Rails, Valley del.	19.00 cash.
450 Tons Short Steel Rails	15.50 cash.
250 Tons Old Iron Rails, Valley del.	19.25 cash.
100 Tons Mixed Steel Rails	15.50 cash.

**Scrap Material.**

1,000 Tons No. 1 W. R. R. Scrap, net.	14.25 cash.
400 Tons No. 1 W. R. R. Scrap, net	14.50 cash.
200 Tons No. 1 W. R. R. Scrap, net.	15.00 cash.
100 Tons Leaf Spring, gross.	19.50 cash.
100 Tons Coil Springs, gross.	18.00 cash.

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

Main table containing stock quotations for New York Mining Stocks, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name and Location of Company, dates from Aug 27 to Sept 2, and Sales figures.

\* Ex-dividend. + Dealt in New York Stock Ex. Unlisted securities. † Assessment paid. ‡ Assessment unpaid. § Dividend shares sold, 7,840. Non-dividend shares sold, 14,600. Total shares sold, 22,440.

BOSTON MINING STOCK QUOTATIONS.

Table containing Boston Mining Stock Quotations. Columns include Name of Company, dates from Aug 26 to Sept 1, and Sales figures.

Dividend shares sold, 6,183. Non-dividend shares sold, 1,905. Total shares sold, 8,088.

COAL STOCKS.

Table containing Coal Stocks. Columns include Name of Company, dates from Aug 27 to Sept 2, and Sales figures.

Total shares sold, 653,044.

San Francisco Mining Stock Quotations.

Table containing San Francisco Mining Stock Quotations. Columns include Names of Stocks, dates from Aug 26 to Sept 1, and Sales figures.



DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table containing two columns: 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND PAYING MINES'. Each column lists mine names, locations, capital stock, shares, and dividend details.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. \* Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$42,900,000. \*\* Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Kly Company, which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Bell, that mine declared \$2,400,000 in dividends, against \$425,000 in assessments.



STOCK MARKET QUOTATIONS.

Table with columns for company names and prices. Includes 'Aspen, August 27' and 'The closing quotations were as follows:'.

Table with columns for company names and prices. Includes 'Baltimore, Md. Sept. 1' and 'COMPANY' column.

Pittsburg, Pa. Prices highest and lowest for the week ending Sept. 1:

Table with columns for company names and prices. Includes 'COMPANY', 'H.', and 'L.' columns.

Table with columns for company names and prices. Includes 'Deadwood, August 27' and 'Bid', 'Asked' columns.

St. Louis, August 31. The closing quotations were as follows:

Table with columns for company names and prices. Includes 'Adams, Colo', 'American & Nettie, Colo', etc.

Helena, Mont.

(Special report by SAMUEL K. DAVIS.) Prices highest and lowest for week ending August 27:

Table with columns for company names and prices. Includes 'Bald Butte (Mont.)', 'Benton Group, Mont.', etc.

Foreign Quotations.

Table with columns for location, company name, and price. Includes 'London, August 30' and 'Paris, August 18'.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Lists various commodities like acids, alcohols, and chemicals with their prices.

Marble Dust - # bbl. \$1.50

Table listing various materials and their prices, including 'Metallic Paint', 'Mineral Wool', 'Phosphorus', etc.

THE RARER METALS.

Table listing rarer metals and their prices, including 'Aluminum', 'Arsenic', 'Barium', etc.