

The Engineering and Mining Journal

WITH WHICH IS CONSOLIDATED "MINING AND METALLURGY."

VOL. LXXIV.

NEW YORK, SATURDAY, September 13, 1902.

No. 11.

THE ENGINEERING AND MINING JOURNAL

(Incorporated.)

261 BROADWAY, NEW YORK.

TELEPHONE 6866 CORTLANDT. P. O. BOX, 1833.
CABLE ADDRESS "ENGINJOUR" N. Y."

W. J. JOHNSTON, President. F. J. PRATT, Treasurer.

CHICAGO (Telephone, Harrison 3326)	520 Monadnock Building
DENVER	206 Boston Building
SALT LAKE CITY	Dooly Building
BUTTE	19 & 20 Owsley Block
SAN FRANCISCO	Mills Building
VANCOUVER, B. C.	Molsons Bank Building
LONDON, ENG.	20 Bucklersbury, 363

DAVID T. DAY, PH.D.	Editor in Chief
EDWARD W. PARKER	Managing Editor
FREDERICK HOBART	Associate Editor
ROSSITER W. RAYMOND, PH.D., M.E.	Special Contributor

SUBSCRIPTION

Single Copies, 15 Cents.
United States, Canada, Mexico, yearly, 52 copies, in advance, \$5.00
Other countries in Postal Union, \$7.00
By Bank Draft, P. O. Order or Express on N. Y.
English Subscriptions Payable at London Office, £1 8s 9d

CHANGE OF ADDRESS

Please give your old as well as your new address

NOTICE TO DISCONTINUE

Should be WRITTEN to the New York Office in every instance

ADVERTISING COPY

Should be at New York Office by 10 A. M. Tuesday of issue week

Copyright, 1902, by ENGINEERING AND MINING JOURNAL
Entered at New York Post Office as Second Class Matter

CONTENTS.

Editorial Notes.....	335
Tin Mining in Cornwall.....	335
Australian Gold Production in 1902.....	335
Market Conditions.....	336
The Mining Congress at Butte.....	336
Recent Utterances on the Anthracite Strike, R. W. Raymond.....	336
*Steel Lining at "B" Shaft, Pioneer Mine, Minn.....	338
Iron and Steel Exports and Imports.....	340
The Reactor Process for Treating Copper Matte.....	340
International Mining Congress.....	341
First Aid to the Injured in Mining.....	341
Great Exposition as Aid to Mining.....	343
What Constitutes a Mine.....	343
The Mechanical Engineer in Modern Mining.....	344
Engineers on the Metric System.....	344
Trade in Florida, Phosphate in 1902.....	344
The Carmichael Process of Lead Smelting.....	345
*Sir Frederic Augustus Abel.....	345
*Charanpore Colliery, Bengal.....	346
Recent Decisions.....	347
Books Received.....	347
Books Reviewed.....	347
Correspondence.....	348
Questions and Answers.....	349
*A New Hoisting Drum.....	349
*The Cummer Self-Contained Dryer.....	350
*Press for Making Artificial Stone.....	350
*Patents.....	350

* Illustrated.

DEPARTMENTS.

Assessments.....	364
Chemicals, New York and Foreign.....	362
Coins, Foreign.....	363
Dividends.....	364
Financial Notes.....	363
Industrial Notes.....	353
Markets: Coal, United States and Foreign.....	360
Iron and Steel.....	361
Metals: Gold, Silver, Copper, Tin, Lead, Spelter, Antimony, Platinum, Quicksilver, etc.....	363
Mining News: United States and Foreign.....	354
Mining Stocks.....	359
Obituaries.....	352
Personals.....	352
Schools, Technical.....	352
Societies.....	352
Stock Market Review: United States and Foreign.....	359
Stock Quotations.....	364
Trade Catalogues.....	353

THE ENGINEERS of Chicago, who are progressive in all things, seem to have fully realized the advantages to be secured by the adoption of the metric system. Recently the question of the approval of the bill before Congress for the adoption of that system in government transactions was the subject of the report of a special committee of the Western Society of Engineers. The report is an excellent one, carefully considering the various aspects of the case, and the conclusion was strongly in favor of the bill. The full statement of this conclusion will be found in another column, and it deserves careful reading.

LITTLE OR no attention has been called so far to the effect which the low prices of silver now prevailing must have upon the cost of producing copper. The average price of silver in August was near 6 cents an ounce below that of August, 1901, and this difference must have a considerable effect on the profits of those mines whose copper carries an appreciable quantity of silver. Taking the known results of some important mines in past years, it may be calculated that the drop in silver may make a difference varying from 0.2 to 0.4 cent per pound of copper produced—an amount sufficient to make a serious difference in profits. This is of especial importance when the margin between the cost and selling price of copper is small, as it is at the present time.

AN EFFORT is being made in London to exploit the stocks of a number of companies which have locations in the eastern part of the Witwatersrand, beyond the belt which has heretofore been regarded as gold producing. There is no doubt that in that section gold bearing veins do exist, but the general belief in the Transvaal has been that they are too low in grade, too small and too much broken up by faults to be worked profitably. A contrary impression is what certain operators wish to produce; and it is to this that we may attribute certain despatches which have appeared in the London papers in relation to discoveries in the section referred to. More of the same kind may be expected, but readers should receive them with caution. New discoveries are, of course, not impossible, but to make them of any importance much more extensive development work will be required than has yet been done.

THE LATEST report of the Chamber of Mines of Rhodesia, which has been given in our news columns, shows the extent of the demand for native labor in the South African mines. It appears that already the agents sent out from Rhodesia and those from the Transvaal have come into conflict and have endeavored to secure native labor by various misrepresentations. The country as far north as the Zambezi River has been scoured for labor, and agents are penetrating north of that river and into Portuguese territory for the purpose of securing negroes to work in the mines. That these men do not find conditions the same as represented to them by the agents is perhaps best shown by the fact that the report admits that desertions during a single month amounted to over 15 per cent of the total working force. It is no wonder that the representatives of the mining companies are considering various expedients, among

which a sort of system of enforced labor holds a prominent place, while the importation of East Indians and even of Chinese is being seriously discussed.

TIN MINING IN CORNWALL.

Tin mining in Cornwall does not improve and it must be confessed that the prospects are rather depressing. The reorganization of the Dolcoath Mining Company some years ago, and its adoption of new methods were expected to give an impetus to the industry, and for a time the results were encouraging. Recent reports, however, do not show favorably. The report of the Dolcoath Mine for the first half of the current year shows a profit of over £14,000, which is less than the profits of the two previous half years, and compares unfavorably with £32,000 for the first half of 1900. It is not proposed to pay any dividend, but to devote the funds to various improvements that are necessary. After the reorganization in 1895 large sums of capital were spent in putting the mine in order, and it was expected that it would be placed on a permanently paying basis. In 1899, 1900 and 1901 dividends were paid regularly, though not a high rate, and it is somewhat disconcerting therefore to find that the profits are now required for what may be called capital purposes. The chief cause for the fall in profits is the continued reduction in the contents of the ore milled. The contents are now 43½ pounds of block tin per long ton of ore, and show a steady and regular drop since 1895, when the figure was 79 pounds per ton. The price of tin has not had much varying effect on the profits during the past 18 months, and, of course, the large profits of 1899 and 1900 were due entirely to the high price of the metal during those years. It is expected that further economies will enable the company to pay on the lower grade of ore now ruling; but, of course, the actual prosperity will depend, as in all metal mining, on the vagaries of the metal market.

Another of the Cornish companies that was reorganized recently—the Carn Brea and Tincroft Mines, Limited—has not done as well as the Dolcoath. The average contents of ore per ton is only 27 pounds of block tin, and the lodes are not so steady. During the last 18 months losses have been made, and money is still being spent on capital account in exploring work. In all probability the mine will be continued, however, as the directors and shareholders are all men interested in the district in other ways, and even though losses are made in the company, the local prosperity brought by the operation of the mine will no doubt recoup them.

AUSTRALIAN GOLD PRODUCTION IN 1902.

The gold production of the Commonwealth of Australia and of New Zealand has been maintained during the present year at a better rate than might have been expected. Notwithstanding the continued drought prevailing over a large part of the Australian continent, and some other drawbacks, there has been little change in most of the States, while Western Australia has shown a large increase. We have now the figures for nearly all the States for the first half of the current year, which the *Australian Mining Standard* has reduced to fine gold from varying values given by the different mining departments. In the table below we give the values in dollars, add-

ing an estimate for the comparatively small output of South Australia and Tasmania. The figures for the half-year, compared with the first half of 1901, are as follows:

	1901.	1902.	Changes.
Western Australia...	\$15,746,319	\$18,396,031	I. \$2,649,712
Victoria	6,948,398	6,889,125	D. 59,273
Queensland	5,387,346	5,822,532	I. 435,186
New South Wales...	2,117,523	2,361,796	I. 244,273
Tasmania & S. A'ralia.	950,000	1,025,000	I. 75,000
Total Australia..	\$31,149,586	\$34,494,484	I. \$3,344,898
New Zealand.....	3,890,878	4,065,830	I. 174,952
Total	\$35,040,464	\$38,560,314	I. \$3,519,850

The total increase this year was 10 per cent; but three-fourths of this was contributed by Western Australia. It is encouraging to find, however, that while most of the gains were small the States have generally held their own. The only one showing an actual loss was Victoria, and in that case the decrease is less than 1 per cent. Queensland gained 8 per cent and New South Wales over 11 per cent on its comparatively small production.

Early in the year it looked as if a decrease in the gold production—outside of Western Australia—might be expected. The second quarter, however, has changed matters, and it now seems fairly probable that the Australian gold production for 1902 may show a good increase over that of last year.



MARKET CONDITIONS.

Iron and Steel.—The iron market shows little change, remaining comparatively quiet. This does not mean any cessation of activity at furnaces and mills; but many large producers are out of the market for the time, and are not taking orders. The pressure for early deliveries is not so great, partly because some late buyers have secured supplies, and partly because others have given up the attempt. Import business continues on a considerable scale, and is affecting the English and German markets.

Copper.—The copper market shows a better tone and more indications of strength than for some time past. Consumers are taking more interest in the market, and the large consumption of the metal is making itself felt. The influence which has been persistently depressing the market seems to have been overcome, at least for the time, and the natural conditions of supply and demand are asserting their right to control. As the statements given in our columns last week show, there are now no stocks of metal in excess of those necessarily carried by producers and refiners, while the consumption here and abroad is fully equal to the production. These facts are beginning to be appreciated, as is shown by the improving condition of the market. There is no speculative element of any importance at the present time, and such advances as are made are based upon the actual conditions of the trade.

Other Metals.—Tin has been somewhat dull and depressed, chiefly owing to the fall in London prices. There have been reports of the closing down of the tin-plate plants here, but there is no reason to anticipate any considerable fall in production.

Lead continues unchanged in price, with current consumption large and sales well maintained.

Spelter is still strong and prices show no change. Orc prices in the Joplin market has been a little lower.

Silver remains dull and prices continue low. The demand from the East continues comparatively light. London sales to China, India and the Straits for the seven months ending July 31 show a decrease this year of nearly 12 per cent in quantities and over 21 per cent in values.

Coal.—The Western coal trade is still disturbed by the lack of sufficient transportation. Shortage of both cars and motive power is the general complaint. Coal enough is and can be mined, but operators are

limited by the quantity which the railroads can take away from the mines. The Lake shippers are especially disturbed as the close of navigation gradually approaches, and they see no improvement in conditions.

In Chicago and other Western cities the supplies of anthracite are exhausted and dealers cannot supply consumers who usually put in stocks for the winter about this time. The consequences are shown in general advances in the prices of the better grades of bituminous coal.

The seaboard bituminous coal market remains in fair condition, and no material changes are to be reported.

The anthracite coal market depends on strike conditions altogether, as for the past three months. Recent occurrences are fully considered in another column. At the present time we can only say that no general resumption of work is in sight.



THE MINING CONGRESS AT BUTTE.

The meeting of the International Mining Congress in Butte last week formed a critical point in the history of that association; and it is for that reason that we give considerable space elsewhere to a full report of its proceedings. Our readers are aware that we have not heretofore attached much importance to the Congress, believing that its loose organization and uncertain membership admitted to its meetings a large number of promoters, politicians and other outsiders, who have striven to use what influence it might exert for their own ends. The prominent part taken by this element repelled the practical miners, for whose benefit the Congress was first intended, and at several of the meetings mining men of standing have been absent altogether or have taken no active part in the proceedings.

This year, however, some mining men who were present undertook to reorganize the association on more practical lines, in the hope that it might become a permanent and useful association. Their plans were finally carried through in the face of much opposition from the element which has heretofore brought discredit upon the Congress and which hoped to profit by its continuance on the old lines. The plan of reorganization is given fully in our report, and we can only say here that those who formulated that plan believe that under it the American Mining Congress—as it is now called—may be made into an association representing the practical miners of the country and competent to discuss their claims and needs. For such an association there is certainly a field in the future. It can deal with the practical, as distinguished from the technical and scientific side of the mining industry—which is already well represented—and act as a representative body upon occasion. We hope sincerely that these expectations will be realized.

The action of the Congress on the Kearns amendment to the United States mining law was in some respects a disappointment. The refusal to enforce the principle involved in that amendment was somewhat unexpected. The relief from the burdens of uncertainty and litigation which will result from the abolition of extra-lateral rights will be welcome to the very large majority of practical miners. The adverse vote on this question was due probably to the presence of a large number of delegates who were not actually miners; to the strong local influence exercised by parties who have profited by the extraordinary litigation in progress in Montana under the existing law, and to certain political influences not unknown in the Butte district. Had the Congress been constituted as we hope it will be hereafter the result would have been different.

As to the vote in favor of a Department of Mining, with a cabinet officer at its head, it seems to us that little importance is to be attached to it. We are not aware of any pressing demand from mining men for such a department, nor can we see that any advantages are to be gained from its creation, which would counterbalance the cost of the additional offices required. Our mining interests are fully able to take care of themselves, and need no government interference beyond the enactment of equitable mining laws. The element in favor of the new department seems to have been chiefly the promoters and schemers, who will, we believe, become under the new organization of far less importance in the proceedings of the Congress than they have been at previous meetings. Our readers know that we have always opposed the multiplication of offices and departments, and have advocated the reduction of government interference with industry to a minimum. We see no reason to depart from that position, in which we believe that we have the support of the great majority of practical miners and mine operators.

Upon the whole the action of the Congress gives hopes that it is to be constituted hereafter on a rational and stable basis, which will make it a useful and practical body. To attain that result we are willing to give all the aid in our power.



RECENT UTTERANCES ON THE ANTHRACITE STRIKE.

Since the publication of my last article on the anthracite strike three important contributions have been made to its current record—the answer of Mr. Baer to the Senators of Pennsylvania, the publication of part of Colonel Wright's report, and the contribution of Mr. John Mitchell to *Collier's Weekly* of September 6, entitled "The Voice of Labor; the United Mine Workers' Side of the Anthracite Coal Miners' Strike."

I.—Mr. Baer's statement, like everything that has come from him, is clear, temperate and unanswerable. The *New York Times*, which recently characterized him and his colleagues as incompetent in the management of their trust, has been moved by it to declare that now at last Mr. Baer shows himself competent. Such sudden acquisition of competency is not common, except in journalism; and the *Times'* naive complaint that certain things said by Mr. Hewitt and Mr. Baer had not been said long ago, so that it might have known as much then as it thinks it knows now, is amusing. The *Times* might have known it all by the exercise of memory or reason. Either may be enough; but the absence of both makes respectable journalism difficult. For instance, the *Times* didn't know that the right of the laborer to work if he chose was even an alleged issue in this case, until Mr. Hewitt said so. But if it had reasoned from daily events, it could have reached that conclusion; and mere memory, without reasoning, might have enabled it to recall, among other utterances of similar character, the following passage from the letter of President Thomas, of the Erie Coal Company, to John Mitchell and others, representing the United Mine Workers of America.

"In some cases mines have been closed for long periods, and some of them are still closed, because the members of your association decline to allow men not belonging to that organization to work in the same mine. Not only that, but in many of the mines the drivers have at different times declined to deliver cars to non-members of your association.

"It is the inalienable right of a man to labor, and this without regard to nationality, creed or association. To seek to prevent it is a crime, and we cannot, even by implication, sanction such a course."

This was part of the manifesto of the operators, upon the receipt of which Mr. Mitchell declared war.

It was published by the *Times*. Should not an editor betray some knowledge of his own columns?

The fact is, Mr. Baer's excellent statement contained nothing new. The ultimatum of the presidents, last June, stated all the grounds of their position, and has needed no addition since, except repetition, "lest we forget."

II.—Of Colonel Wright's report, I have not seen the full text. From those portions of it which have appeared in different journals, it is easy to see that this friendly inquirer can find no justification for the continuance of the strike by Mr. Mitchell. All his recommendations refer to a future readjustment of relations, and tacitly imply as a preliminary the abandonment of the strike. Under these circumstances, it is not necessary to discuss now his proposal of amicable reorganization, etc., hereafter. Of course, Mr. Mitchell and his national organization are not willing to be turned down, as Colonel Wright mildly suggests. Nor will the anthracite strikers themselves wish to organize a new union, confined to that business, and accepting the rule of complete toleration for non-union labor, which Colonel Wright stipulates. In this connection, it may be noted that Mr. Mitchell's specious disclaimer of official action against non-union labor is contradicted in several ways, but especially by the official action of two or three local anthracite unions. Colonel Wright's advice that this point be absolutely surrendered is not likely to be palatable to them. The whole report, therefore, both as to its immediate effect, and as to its proposals for the future, is disagreeable enough to Mr. Mitchell and his party.

III.—Mr. Mitchell's latest statement of his case is feeble and futile. It is noteworthy, in the first place, for its omissions.

1. It omits to recognize the fact that violence and outrage have become a daily and essential part of the tactics by which the strike is prolonged. Indeed, it makes a dishonest plea that "there has been less infraction of the law and fewer arrests during the time the strike has been in progress than for a like period preceding it." "Isolated cases of violence have occurred," but they were not encouraged or countenanced by the union! This, in the face of the fact that every day brings its new brace of murders or murderous assaults; that in one of the towns to which he proudly points as exceptionally peaceful 200 cases of strikers' outrages crowd the docket of a single court, and that in the first criminal trial of this class the reported result is that, owing to the presence of strikers who became jurymen after the Commonwealth had exhausted its peremptory challenges, the jury has been, and the murderer will not be, hung!

2. This statement omits to say who made the average wages of anthracite labor what they are. He still adheres to his talk about "average earnings," in the calculation of which he includes breaker boys, drivers and laborers. But who fixed the wages of the "laborers?" They are employed by the miners, and the companies have no more to do with the matter than to accept the order of the miner, and pay the wages of his laborer out of the pay due to him. In 1900, after 10 per cent advance in miners' pay had been granted by the operators, some of the miners first reduced the wages of their laborers, and then added the 10 per cent, so that the laborers got no more than before. This was not universally done. In fact, the payment of laborers by their employers, the miners, is by no means uniform. Mr. Mitchell thinks there should be a uniform scale for the direct employees of a company. Why has he never urged this, and why have the members of his organization never practised it, toward the employees of miners?

It is well known to insiders that the treatment

of the laborers by their employers had roused much resentment among them, and that the danger of the organization of a mine-laborers' union, which should apply to their tyrants the well-known methods of coercion, backed by superior numbers and fierceness of passion, was one of the causes of the present strike, through which, it was hoped, the laborers could be placated by a portion of the plunder wrung from the operators and the public. By the way, Mr. Mitchell's frank suggestion, that the public should be made to pay, is one of the things he now conveniently omits to mention.

3. Another point which Mr. Mitchell treats with disingenuous reserve is the payment of miners by the ton of coal mined. He omits to mention here what Colonel Wright frankly declares, that this affects only 40 per cent or less of the anthracite miners. But, since he states as one of the demands of the united mine-workers that "coal mined shall be weighed wherever possible," it is clear that, in his view, the system of payment per ton ought to be extended, and that those collieries which have adopted the system of payment per carload hoisted, should abandon it. Accepting that standpoint, let us see what his contention amounts to. He complains that the miner is required to produce from 2,740 to 3,190 pounds for a ton of coal, although the consumer gets 2,240 pounds when he buys a ton. But he omits to say that the consumer buys a material entirely different from that for which the miner is paid, namely, the miner's product, crushed, cleaned and sorted, and that such a ton of coal is never contained in a ton of the crude product. Mr. Mitchell seems to recognize this fact tacitly when he says:

"The operators, of course, say that the excess weight is required to compensate them for impurities and refuse material that is loaded with the coal and cannot be marketed. But, if their statement be true, why is it necessary to continue a system of docking by which, at times, they arbitrarily deduct from a miner's earnings from 10 to 15 per cent of the total, as a penalty for loading impurities, for which they have already penalized him in excess weight?"

It is hard to believe that Mr. Mitchell does not know the answer to this question. But I will give it, nevertheless. The nature of the anthracite beds worked in different collieries, or even of the same bed in different parts of the same colliery, varies so widely as to the net value of each cubic yard or ton broken down for extraction as to make the gross product of the miner's work highly variable in value. If the miner is to be paid, therefore, per ton of coal mined, there must be in each colliery or, perhaps, each part of the same colliery, a certain proportion, agreed upon beforehand, to be deducted from the gross product for waste material, included in the crude product. This amount it is the universal practice of mine officials to fix at such a figure that an honest miner shall get good wages. Mr. Mitchell seems to admit that this deduction, if fairly determined, is not unjust. I would merely remark, in passing, that if it is really to be fixed with perfect fairness, the result must be a different scale of payment for each different set of conditions, and that Mr. Mitchell's proposal of uniform rates is thereby shown at once to be impracticable. Colonel Wright, indeed, suggests some system which would be fair "on the average," though, perhaps, hard on individual collieries. But there is no arrangement by which the successful operators are bound to pay the losses of the unsuccessful. In short, there is no "anthracite trust," and uniform rates and methods of payment would inevitably operate against those enterprising parties who are trying to employ labor and produce coal under natural disadvantages.

But Mr. Mitchell's present question is, Why should any further deduction be made from the miner's pay after the one just mentioned? This I shall frankly answer.

The deduction already mentioned is determined by the nature of the coal seam mined. If it has been unjustly fixed, to the injury of the miner, the wrong should be rectified. But it will be only a local wrong; and Mr. Baer's personal offer to go with Mr. Mitchell and investigate any such question is conclusive of further debate on that head. But this deduction, previously announced and accepted by the miner when he accepts employment under that condition, covers only such worthless material as will be, by reason of the nature of the coal seam, inevitably included in the gross product honestly mined, but not specially sorted under ground. In other words, the employer says to the miner, "I will not make you pick out, in your underground chamber, the slate partings and "bony" seams of the coal. When you send to the surface a gross bulk or weight of material, I will credit you with so much of it as coal, and I will make the separation myself." Let us assume that this deduction has been fairly fixed, and has been accepted by the miner.

But there is a good deal of absolutely barren rock broken under ground, which never ought to go to the surface at all, being both worthless there and valuable below, where it is needed for packing and filling. This material is usually broken down by workmen specially employed in "dead-work," and paid therefor. It may, however, be thrown down in a working-chamber, by the excessive use of powder. In the latter case, not belonging to the coal seam proper, it does not come within the miner's contract, and he cannot claim pay for it. The miner himself, leaving the mine after his day's "holes" have been fired, has no personal knowledge of the way in which his servant, the laborer, loads the cars. But if the latter *should* put in, at the bottom of a car, under the ordinary crude coal, a lot of slate from "dead-work" near by, or from an excessively heavy blast in the chamber, the result would be a fraudulent profit to both. Now, the company is entitled to some protection against deliberate fraud like this, and the contractor certainly ought to be responsible for the acts of his employees. The ordinary practice, in such cases, has been to withdraw and inspect from the cars coming to the surface at intervals, and without previous notice, a loaded car, and if it proves to have been fraudulently loaded, to refuse payment for it altogether. This is what Mr. Mitchell means by the unjust deduction from a miner's earnings of "10 to 15 per cent." He means that if, out of the six carloads which, I believe to be the usual day's work fixed by the union, one is found to have been fraudulently loaded, the miner's work as to that one goes unpaid.

And what he thinks ought to be done in such cases is indicated by the Pennsylvania law, secured by his party, concerning bituminous coal—according to which, after the discovery of such a fraud, the miner must still be paid for the good material on the top of the fraudulent. In other words, the miner can attempt such a scheme with impunity. If it succeeds he will get payment to which he was not honestly entitled; if it fails, he will get, anyhow, all that to which he *was* entitled. On one side much gain; on the other no loss!

But I must stop here, for lack of space. Such questions as these, Who is responsible for the foreign labor in the anthracite regions? What is the reason that foreign laborers there live in squalor, while American miners, under the conditions of the past 25 years (characterized by Mr. Mitchell as intolerable), have acquired ownership of their own homes, sent their sons to college, and accumulated large balances in banks? What does Mr. Mitchell's oft repeated offer of "arbitration" amount to?—with others of the same sort—must be considered hereafter.

R. W. RAYMOND.

STEEL LINING MINE AT "B" SHAFT, PIONEER MINE, MINNESOTA.*

This shaft is 6 feet by 17 feet 6 inches inside dimensions; and dips at an angle of 70 degrees. It contains two hoisting compartments, each 6x6 feet and a third, smaller compartment for ladderway and pipes. The shaft is intended for the operation of two five-ton skips, on tracks of 4 feet 7 7/8 inches gauge. Back runners are provided to guard against the skips leaving the track.

General Construction of Sets.—The form and general construction of sets are shown by Fig. 1; the hanging-wall plate, CD, and the footwall plate, EF,

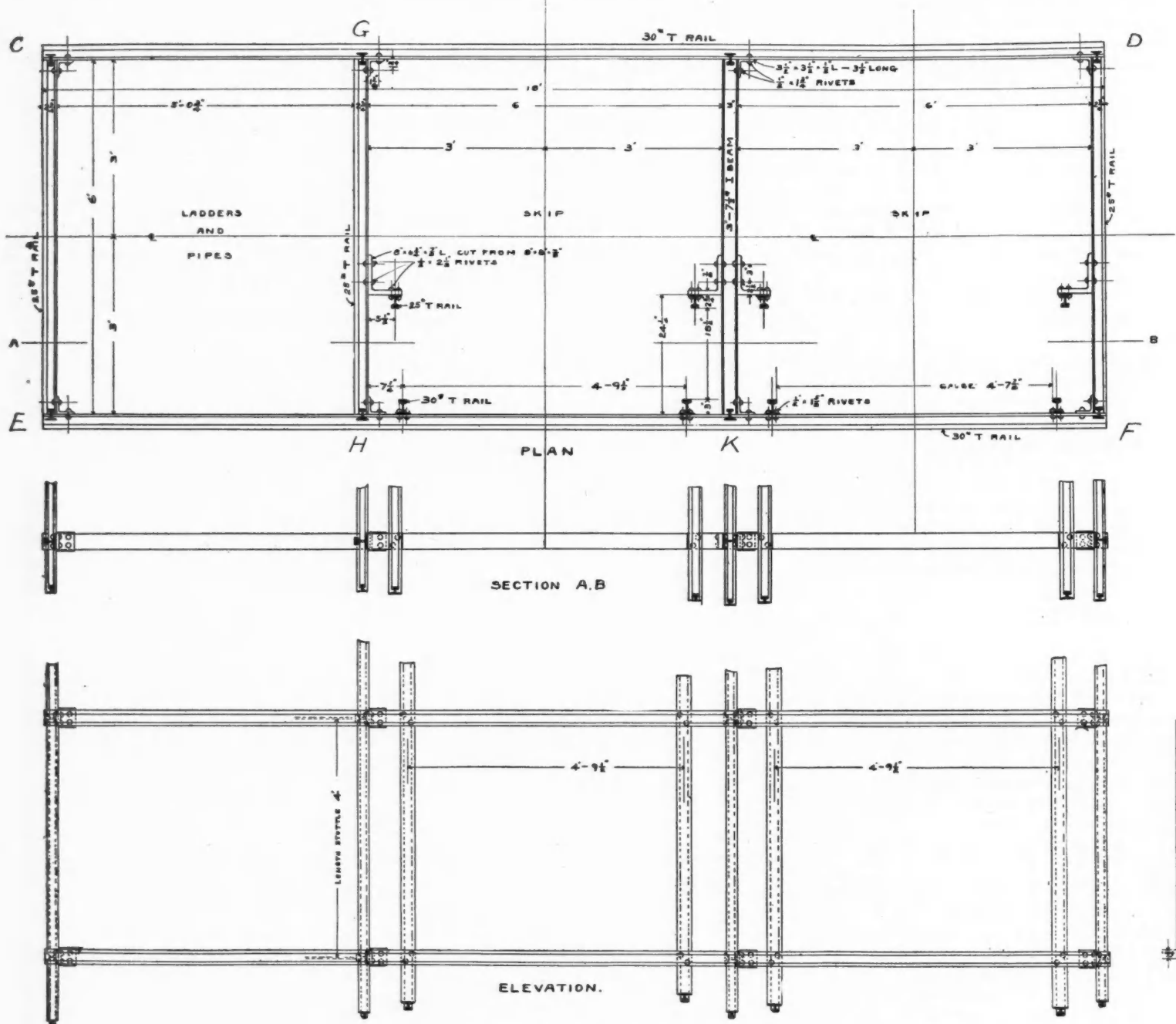
can be economically employed. The various members of the sets are connected together by connecting pieces of 3 1/2 x 3 1/2 x 1/2 inch angle, (3 1/2 inches long) secured by 1/2-inch rivets, there being two rivets in each leg of the angles. Pieces 3 inches long, of 8x8x3/4 inch angle, are used as brackets for supporting the back runners, and are riveted to the end- or dividing-pieces as the case may be, with four 1/2-inch rivets.

Studdles.—The studdles consist merely of pieces of rail, each 4 feet long, and having its ends slotted as shown in Fig. 1. The head of the rail forming the studdle, faces toward the inside of the shaft, and ex-

short lengths are required, many short pieces of old rail that would otherwise go to the scrap heap, can thus be utilized.

Lagging.—In the upper portion of the shaft the rock was firm, and of such a character that no small pieces were likely to fall from the walls. Here the shaft was not lagged tightly, but instead, old wire ropes were stretched longitudinally along the ends and back of the shaft, closely enough together to prevent the falling of any large pieces that might become loosened from the walls.

This answered every purpose until the ground became of such character that there was danger of small



STEEL LINING "B" SHAFT, PIONEER MINE.

being formed of 30-pound rail; while the end-pieces, CE and DF, and the dividing-piece, GH, are formed of 25-pound rail, and the dividing-piece, IK, of 3-inch 7 1/2-pound I-beam. Beams could be used for wall-plates and end-pieces also, but as a rule, for such light members as are required in this case, they will be more expensive than rails, and they are employed for the dividing-piece between the skip compartments, only because of their more convenient form. In cases where the conditions require the use of rail of 50 pounds, or greater weight per yard, however, beams

tends down between the head and flange of the end-piece, (or between the two flanges, if an I-beam is employed, as would, in some instances, be the case if it was a dividing-piece) and rests on the web of the latter; thus the studdle is prevented from moving in a direction parallel to the wall-plate. The studdle is also prevented from moving in a direction at right angles to the wall-plate. When there is pressure between the sets, therefore, the studdles cannot be knocked out by anything less than some force that will bend them.

We employ 16-pound rail for studdles, when new rails are purchased for the purpose, but it is evident that almost any size of rail can be used; and, as only

pieces falling from the rock, and then the ordinary wooden lath of 2-inch plank were used. Of course it would be very desirable to use metal lath, were it not for the expense, as the employment of wood for this purpose very materially diminishes the fire-proof quality of the lining. To partially offset this, Mr. Cole has suggested that we introduce sections of metal lath at intervals of depth, to act as breaks for retarding the spread of fire starting in any part of the shaft. In pursuance of this idea, it is proposed to use metal lath for a length of four sets, or 16 feet, in every 100 feet of depth.

Corrugated steel and buckled plates are about the only materials available for metal lath. Ordinary flat

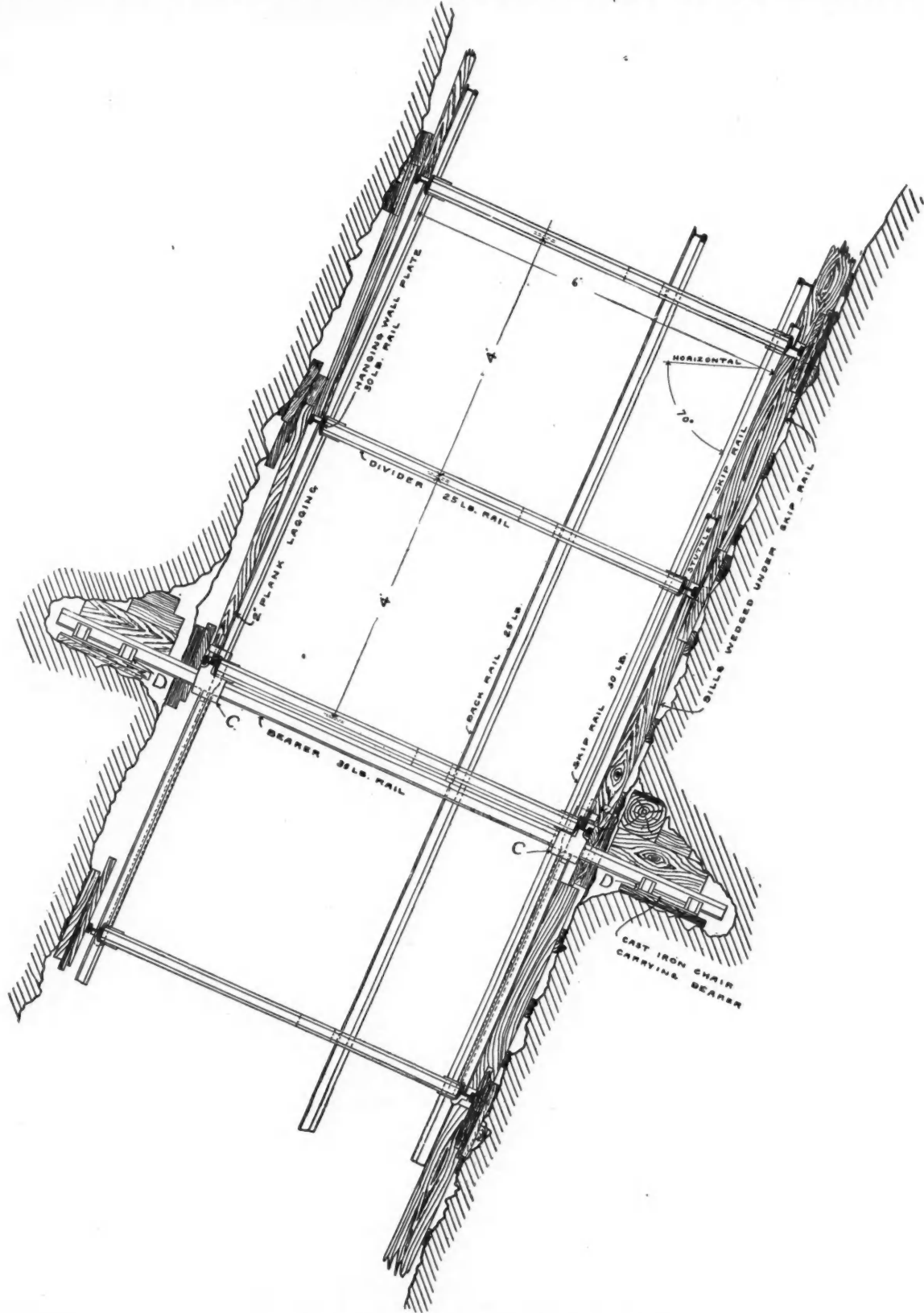
*Abstract of a paper on the use of steel in lining mine shafts, by Frank Drake, Duluth, Minn. Read at meeting of Lake Superior Mining Institute.

plates, stiffened by angles, could be used, but for equal strength they are much more expensive than either of the other materials. Some doubt has been expressed as to whether corrugated steel would be sufficiently durable for this purpose. No. 16 steel, however, which is the heaviest material that is corrugated, is 1-16-inch thick, and if galvanized would, it would seem, last a long time; possibly as long as the steel

course be had to buckled plates. The latter are not ordinarily made less than 1/4-inch thick, and when of this thickness, will sustain about 560 pounds per square foot. Buckled plates of 3-16-inch thickness can, however, be had upon special order, and would carry about 400 pounds per square foot, or somewhat more than 2-inch plank.

When wooden lath, corrugated steel, or buckled

great to allow them to fit down between the head and flange of the wall-plate, or end-piece; and thus but little of the flange (only 1/2-inch, with 25-pound rail) is available for supporting the lath against pressure tending to force them into the shaft. This last objection would not hold in the case of metal lath, as, being thin, they would fit down against the web of the wall-plates or end-pieces, so that the full height of



STEEL LINING "B" SHAFT PIONEER MINE.

of the framing. Corrugated steel of the weight suggested, would be much cheaper than any other fire-proof material that has been proposed. A single thickness would not have the strength of sound 2-inch plank, being capable of carrying but 200 pounds per square foot, distributed load, as against 360 pounds for the plank, but it would, it is thought, be sufficient for most ordinary shafts. Where this was not the case, two thicknesses could be used, or re-

plates are used, the pieces may either be cut of such a length as to fit, at both ends, against the flanges of the members of the sets, or so that they rest against these flanges at their lower ends, but at their upper ends, against the heads of the set-members. The former method has the disadvantage that the lath cannot very easily be taken out or replaced; and also, when wooden lath are used, that unless the ends of the lath are specially prepared, their thickness is too

the flange would support the lath. On account of the disadvantages of the first method of placing the lath, as just described, the second method has been mainly used in this shaft.

Hangers.—In sinking, the steel sets are suspended by hangers, in the same manner as wooden ones. We use for this purpose hangers of a form devised by Mr. Charles Trezona, superintendent of the Pioneer Mine, each hanger consisting of a bar, formed into

a hook at the lower end, and having its upper end bent over to hold a vertically-moving screw. This hanger has proved admirably adapted to the purpose.

Skip Rails and Back Rails.—We use 30-pound rails for the skips to run on, and have heretofore used 20 or 25-pound rails for back-runners. Lighter sections would answer for the latter, but have been less readily obtainable. Both the skip and the back rails are riveted to the supporting members of the sets, viz.: the footwall plates in the case of the skip rails, and the brackets provided for the purpose in the case of back rails. Half-inch rivets are used here, as in other parts of the work, two rivets being used at each point of connection, for both skip and back rails. Excepting the holes in the brackets for back rails, which are drilled in the shop, all rivet holes for the attachment of rails are drilled underground.

Sollars and Ladders.—We have constructed these parts of wood, the supporting beams of the sollars resting upon the steel wall-plates, and being secured by U-bolts or other convenient means. These parts could, of course—and advantageously as regards fire risk—be built of steel. This would increase their cost, however, and as the amount of wood they introduce into the shaft is not great, we have not, up to this time, taken any steps in this direction.

Bearers.—The weight of the steel lining is taken up at intervals of depth by bearers, in the same manner as when timber is used. In this shaft we have used for bearing members, pieces of 30-pound rail, extending transversely across the shaft, and resting at their ends in hitches cut in the foot and hanging walls. One bearing piece is put under each end—or dividing-piece of the set immediately above the bearers. Thus, in "B" shaft, four bearing pieces are used.

Other Structural Features.—There are two structural features of the steel lining that are not yet worked out. These are, first, the framing of the openings at levels, and, second, the form and arrangement of idlers for supporting the skip ropes. Neither of these have, up to this time, actually demanded attention, although it would have been well if they could have been determined upon; but pressure of other matters has necessitated deferring them.

Shop Work.—All the steel for the lining is purchased from the mills sawed to the required lengths, as this is much less expensive than cutting the pieces at the mines, with the facilities ordinarily available there. The rivet holes in the members are drilled in an ordinary drill-press, a steel template 1/2-inch thick being first prepared for each kind of member comprised in a set. In the case of "B" shaft, four templates are required, one for the wall-plates, another for the end—and dividing-pieces, a third for the connecting angles, and the fourth for the brackets for back runners. In preparing the various members, the templates are first set on the flange of the beam or rail to be drilled, and the drill is then passed through the hole in the template, and thence through the flange, without any necessity for marking or laying out the work. In this way the drilling can be very quickly and accurately done. The members, thus prepared, are assembled and riveted together complete in the shop, forming a set in all respects as shown by Fig. 1. The riveting has heretofore been done by hand, but we are now investigating the possibilities of a pneumatic riveter, and it seems probable that the use of such an appliance would effect sufficient saving in an average shaft to justify its purchase.

As regards the studdles, the only shop work they require is the slotting of the ends. This we do by heating the piece and cutting the slots with a chisel, but we are preparing to improve upon this method by employing a die, operated by power, which will cut out the slot at one movement.

The only other parts of the steel lining which require shop work are the hangers; there are, however, no features about these requiring special explanation.

The amount of shop work required for making the steel parts is such, that at the ordinary rate of sinking, the usual shop force about a mine can easily make all parts of the lining for one or two shafts, in addition to their regular work.

Underground Work.—The sets, having been com-

pleted in the shop, are transported to the shaft, and lowered in one of the skip-compartments, on a special truck that holds a set with its length extending downward, and its width, or shortest dimension, lying diagonally in the compartment. At the bottom the set is slid forward on the truck and swung into place underneath the last set previously put in, being suspended from the later by eight hangers. The space required for thus swinging a set into place, is such, that the last set, when in place, will not be nearer than 10 or 12 feet to the bottom of the excavation. The next to the last set would therefore be 14 or 16 feet from the bottom, so that, even if only one set at a time is put in it is necessary with sets of this length (18 feet) that the ground be of such character as to stand a short time unsupported for a depth of 14 or 16 feet.

A set, being suspended as described, is first supported, approximately in its final position, by wooden wedges or blocking; then the studdles are put in position, (one at each intersection of wall-plates and end—or dividing-pieces), as also the lagging, or lath, if wood, steel plates or, corrugated steel are used for this purpose, and the set drawn up tight against the studdles by means of the screws in the hangers. The set is then carefully wedged into line with wooden wedges in the same way that a timber set would be secured, except, however, that the wedging is generally confined to the points of connection between wall-plates and end—or dividing-pieces.

In this shaft, as the ground stands well, a sufficient depth for several sets is generally opened, and these then all put in at one time, after which sinking is resumed. When the bottom is closest to the sets, some difficulty at times, arises through damage to the latter by blasting. This is prevented almost entirely, however, by suspending wooden beams beneath the members of the last steel set; and in some instances (in other shafts) we have used a swinging pentice for the protection of the sets; this serving also to protect the men while at work.

IRON AND STEEL EXPORTS AND IMPORTS.

Exports of iron and steel, including machinery, from the United States for the seven months ending July 31, were valued by the Bureau of Statistics of the Treasury Department, at \$57,263,304, against \$61,160,730, for the corresponding period in 1901, and \$76,286,148 in 1900. The decrease this year as compared with 1901 was \$3,897,426, or 6.4 per cent; as compared with 1900, the decrease was, \$19,022,844, or 24.9 per cent. The causes of the falling off have already been commented on.

The more important items of these exports were as follows, in long tons:

	1901.	1902.	Changes.
Pig iron.....	44,598	19,678	D. 24,920
Billets and blooms.....	26,778	1,330	D. 25,448
Bars.....	33,167	22,742	D. 10,425
Rails.....	230,977	54,467	D. 176,510
Sheets and plates.....	24,823	11,601	D. 13,222
Structural steel.....	34,202	38,944	I. 4,742
Wire.....	48,108	59,779	I. 11,671
Nails.....	20,010	20,560	I. 550

The only items showing an increase this year were wire and nails, in which there has been a long established and steady trade; and structural steel, in which the gain was chiefly due to the enterprise of bridge-builders in securing foreign contracts.

Imports, on the other hand, show a considerable relative increase, being valued for the seven months this year at \$19,334,418, against \$10,344,610 in 1901; an increase of \$8,989,808, or 86.9 per cent. The more important items were as follows, in long tons.

	1901.	1902.	Changes.
Pig iron.....	23,980	177,763	I. 153,783
Billets and blooms.....	4,489	122,196	I. 117,707
Rails.....	853	21,475	I. 20,622
Wire-rods.....	9,858	11,108	I. 1,250
Tin-plates.....	33,691	39,669	I. 5,978

While the relative increases, especially in pig iron and steel billets, were large, the actual quantities imported were small in comparison with our total consumption.

Imports of iron ore for the seven months were \$682,490 long tons, against 486,228 tons in the cor-

responding period of 1901; showing an increase of 196,262 tons, or 40.4 per cent. The greater part of these imports in both years came from Cuba though some ore was received from Canada.

THE REACTOR PROCESS FOR TREATING COPPER MATTE.

About a year ago patents were issued to Messrs. Herman Thofern and B. D. St. Seine for a process for treating sulphide copper ores by blowing in the furnace a mixture of superheated steam and air and fine sand. The essential feature of the process is to simultaneously oxidize and scorchify the metallic substances to be eliminated instead of oxidizing and scorchifying them separately, as is being done at most metallurgical works.

In using the Reactor process, as it is called, it is claimed that the lining of the furnace is not damaged, and the expense of operating is largely reduced. Two or more sets of tuyeres are used, which are fed with superheated steam, the blast drawing in with itself the required air and silica. The blast produced by these tuyeres strikes the surface of the molten matte, keeps it clear of slag and causes it to revolve constantly, thus exposing constantly new surfaces to the simultaneous reaction of oxidizing and scorchifying. The operation of the process is rapid, and if the matte contains any gold it is concentrated in the first copper precipitated, and can be taken out separately. The final product is high-grade blister copper, which can be refined in the same furnace so as to make anodes (if silver is present) or ingots and common wirebars. The matte to be treated by the Reactor process may be anywhere from 15 to 60 per cent. Raw copper also can be refined by this method in a very short time. It is further claimed that the copper produced is very clean and tough and contains only traces of impurities, no matter how impure may be the matte that is treated.

The cost of installing new smelters with the process is said to be generally 20 per cent of that of a convertor plant. Moreover, the application of the process to existing smelters is said to cost little, while no skilled labor other than that of good smelters is necessary. No special machinery is required, and the usual repairs are therefore not needed.

It is claimed that the cost of erecting and operating a Reactor plant for 20 tons of copper per day is below \$40,000, and that it can produce copper up to 99.6 per cent at less than \$5 per ton. The losses of copper and silver in the convertor plant, according to the best authorities, amounts to about 3 per cent, while in the Reactor it is said they are insignificant and not above those of the common reverberatory practice. Most of the important Swansea and other European smelters have secured options for the use of the process.

ZINC ORE IN KENTUCKY.—Considerable attention is being attracted by the deposits of zinc ore in Kentucky. These are situated near Marion, in Crittenden County. Since May 1, 1901, the Old Jim Mine is reported to have shipped 4,150 tons of calamine from workings near the surface. Blende has been uncovered beneath the calamine. Shipments of the latter have been made to Mineral Point, Wis., and recently to Joplin, Mo. The Columbia Mine, adjoining the Old Jim, shows a vein bearing blende and galena, associated with fluorspar. The Tabb Mine also shows blende associated with fluorspar. The mixture is a very intimate one, and the attempts to effect a mechanical separation have so far been unsuccessful. The occurrence of blende and fluorspar in this district is rather unique.

A NEW COKE OVEN.—Herr Heinrich Koppers, of Essen, Germany, has patented a new coke oven, in the operation for which it is claimed that only from 50 to 60 per cent of the gas produced is required for heating the ovens, the remainder being available for outside purposes. For forming the oven walls a brick of special pattern is employed, which simplifies the construction.

INTERNATIONAL MINING CONGRESS.

(SPECIAL CORRESPONDENCE.)

BUTTE, Montana, Sept. 6, 1902.

The International Mining Congress, which has been in session here for the last five days, adjourned yesterday, and not until yesterday, the last day of the meeting, was any progress made in the affairs of the Congress. The first four days were devoted to the reading and discussion of papers of more or less interest, and visiting places of interest in and around Butte.

In addition to the papers announced in advance and which were reported in the telegraphic account of the meeting, the following were presented: "Water Resources of the West," by F. H. Newell, chief hydrographer, U. S. Geological Survey; "Montana, the Treasure State," by Mrs. Ella Knowles Haskell, of Butte; "Amendments to Corporation Laws," by W. R. Everetts, of Chicago; "Universal Exposition at St. Louis," by Charles Reeves, of the Louisiana Purchase Exposition; "Mining and Cyaniding," by M. W. Anderson, Butte; "The Economic Advantage of Concentration of Labor and Capital," by David Ross, Springfield, Ill.; "Idaho, the Sunset State," by Mrs. Mary Arkwright, of Hutton, Idaho.

Early in the week the fact became manifest that the Congress was far from being harmonious. More or less dissatisfaction with the methods of governing the body and conducting the meetings has made its appearance at former sessions, but has not developed sufficient strength to inaugurate any material reform in the organization. The malcontents were out in considerable force, however, at this meeting, to which fact, together with the number and length of the papers presented, was probably due the postponing of any discussion of a permanent organization plan until Friday.

On Wednesday, Prof. J. A. Holmes, chairman of the Committee on Permanent Organization, introduced a scheme which, after being subjected to a lively discussion and a few amendments, was finally adopted at the Friday meeting. The plan as amended and adopted is as follows:

Section 1.—That the present organization, known as the International Mining Congress, be reorganized into a permanent organization on the plan outlined below, and that this permanent organization be incorporated as the American Mining Congress.

Section 2.—That the object of this association shall be the promotion in every way possible of the mining industry.

Section 3.—That the officers of this association shall be a president, three vice-presidents, a secretary, a treasurer and an executive committee, to consist of the above officers and three members to be annually elected by the congress.

Section 4.—That the following additional committees be elected by the executive committee:

An advisory committee, to be composed of one member from each State.

A committee on legislation, of five members.

A committee on transportation, of five members.

A committee on finance, of five members.

A committee on program, of five members, to which committee each paper to be presented before any meeting of the association shall be submitted for approval in advance of said meeting.

Section 5.—Membership: Any person actively associated with mining, who, after his application has been approved by the committee on membership, shall pay an initiation fee of five dollars (\$5), may become an active member of this association, and thereafter he shall pay in advance an annual fee of two dollars (\$2) and shall vote and enjoy all other duties usual to members.

Any person entitled to regular membership in the congress may, on the payment of fifty dollars (\$50) become a life member of this congress, and shall, without the payment of further annual fees, be entitled to all the rights and privileges of active membership.

Any person actively associated with mining, with the approval of the committee on membership, shall, upon the payment of a fee of one dollar (\$1) per annum, become an associate member of this organization and shall be entitled to attend the sessions of the congress and participate in its deliberations, but shall not be entitled to vote or to hold office.

Delegates: A chief executive of any country, State or Territory may appoint as delegates to any annual session of this congress fifteen (15) persons, actively associated with mining; and the mayors of cities and towns, boards of trade, boards of county commissioners, scientific associations, miners' organizations, min-

ing bureaus, chambers of commerce, and such other business organizations as may from time to time be designated by the executive committee, may each appoint three such delegates, and each such delegate attending and properly accredited shall be entitled to participate in the deliberations of the congress.

The names of all members and delegates, with their addresses, shall be published annually under the roster of the respective memberships.

All members and delegates are entitled to a copy of the proceedings of each annual session, covered by their dues.

Section 6.—The treasurer of this congress shall give bond for an amount to be decided by the executive committee of not less than five thousand dollars (\$5,000), said bond to be approved by the executive committee, the bond fee to be paid by the congress.

Section 7.—The secretary shall, for the year now beginning, be paid such salary as may be decided upon by the executive committee, and under such regulations as are prescribed by the committee he may receive moneys and receipt for the same, transmitting all such moneys to the treasurer, and he shall give bond as may be required by the executive committee.

Section 8.—Members of this congress may become charter members of the new organization upon prompt registration of their names before the adjournment of this congress and upon payment of the initiation fee of five dollars (\$5).

Section 9.—That all matters pertaining to the incorporation of this congress, and all further details relative to the organization, are hereby referred to the executive committee, with power to act.

Unquestionably the most important action taken at this meeting was the complete reorganization of the congress. Not only was the name changed to the much more appropriate one of the American Mining Congress, but in a large measure the entire plan of the organization was rearranged and put upon a permanent and more comprehensive basis. The intention at first was to "reform it altogether," even to calling at the American Mining Association, but so much opposition developed that in this and other minor respects compromises were affected.

It has been apparent for some years that the International Mining Congress as originally organized did not represent the great mining industries. Notwithstanding the good work done by some of its officers, the congress somehow lacked the confidence of representative mining men.

The fact that delegates to one congress rarely attended subsequent meetings showed a serious weakness in the plan of organization. The promiscuous character of the papers read and the small percentage of delegates practically connected with the mining industries also demonstrated the necessity for the change just made. A similar effort had been made at several previous meetings, but had always been voted down.

At Butte 3 members of the committee on resolutions, headed by Prof. J. A. Holmes, of the North Carolina Geological Survey and Chief of the Department of Mines and Metallurgy of the St. Louis Exposition, organized the movement which finally resulted in an almost unanimous vote of the delegates to merge the International Mining Congress into a new organization to be incorporated under the name of the American Mining Congress, with a constitution and by-laws and a comprehensive quota of officers that will permit of every geographical section and every department of mining being represented.

In spite of the admittedly weak features of the organization, each of the 5 meetings of the congress has called forth a large attendance. This is taken to indicate that there is a field of usefulness for an association of this kind on the right lines. As reorganized, the American Mining Congress ought to merit the confidence and encouragement of those engaged in mining industries. Similar associations in other lines—for example, the National Electric Light Association, the American Street Railway Association, and others—are doing excellent work for the industries they represent. There is no reason why the American Mining Congress should not do as good work in behalf of the mining interests.

The adoption of this plan of reorganization meets with the unqualified approval of the mining men present. The influence of the legal fraternity, politics and Butte was manifested in the Congress by the defeat of the resolution endorsing Senator

Kearns's bill for the simplification of the Federal mining laws. The resolution was introduced by Mr. C. J. Dignowitz, of Utah, on Tuesday. It was referred to the committee on resolutions, and after amendment to suit the majority of the committee was reported back to the session on Thursday, when it was defeated by a large majority.

Next to the adoption of the plan of reorganization, the most important action taken on Friday was the election of officers for the ensuing year. The following were chosen:

President, Judge J. H. Richards, of Idaho.

Vice-president, S. W. Russell, of South Dakota.

Second vice-president, E. R. Buckley, of Missouri.

Third vice-president, T. E. Ewing, of California.

Secretary, Irwin Mahon, of Pennsylvania.

Treasurer, Charles W. Goodale, of Butte.

Executive Committee—L. K. Armstrong, of Washington; John T. Grayson, of Oregon; W. L. Kendall, of Ohio; Irwin Mahon, of Pennsylvania.

The bond for the treasurer was fixed at \$5,000, and that for the secretary at \$1,000.

The new president, Judge J. H. Richards, of Boise, is a practical mining man, well known and respected, not only in Idaho, but throughout the mining districts of the West. Mr. Irwin Mahon, who has been secretary of the congress ever since its organization, will continue to hold that position. The good qualities of the old organization will thus be retained and added to the benefits to be derived under the new order of things.

The Congress accepted the invitation of Delegate Martin, of South Dakota, to hold the next meeting in the Black Hills, the sessions to be divided between the cities of Deadwood and Lead.

During the meeting here much interest was taken in the mineral display at Columbia Gardens, where, on the ground floor, had been scientifically arranged and classified specimens of minerals from all over the world, and a particularly comprehensive display from Wyoming, Washington, Nevada, Idaho, Oregon and Montana. The larger, cruder and less valuable specimens were placed on four stands ranging from the floor up, while in the cabinets at the back and side were the finer and more valuable exhibits, the most valuable being the private collections of A. G. Pohndorf, A. W. Noble, R. Nankervis, W. T. Colban, Montana Gold Mining Company, Capt. John McCormick's world's fair collection and a magnificent exhibit of Senator W. A. Clark's properties, all the products and by-products of the ore as it comes from the mine until it becomes pure copper.

Added to this are the two cases placed just in front of the cabinets in which can be seen the choicest specimens of the mineral exhibits of the world.

In addition to the manufacturers mentioned in the telegraphic report as represented at the meeting should be mentioned the American Concentrator Company by Mr. Guy H. Elmore, president of the company.

FIRST AID TO THE INJURED IN MINING.*

The causes of mining accidents are too numerous and varied to permit of a distinct classification. Those most constantly operative are falls from roof and sides, use of explosives, foul gases, operation of hoisting and traction machinery, explosion of inflammable gases (coal mines), traversing ladder ways, placing of timbers. Under the term miscellaneous may be grouped all others which contribute in any degree to the production of accidents. While many accidents from the nature of things are unforeseen and unavoidable, it is to be regretted that a certain percentage, far too great, is due to either carelessness or disobedience of the rules established for the protection of all, including those who habitually transgress them.

Accidents from the inhalation of poisonous gases are a subject of especial interest to miners, on account of their frequent exposure while working under ground. The best ventilated mines are not entirely free from this danger, and, as a consequence, miners are sometimes overcome by breathing gases collected

*Abstract of a paper read before the International Mining Congress by Dr. George W. King, of Helena, Montana.

or generated in stopes or recesses that cannot be wholly purified. Where good ventilation has not been provided, as in shafts and tunnels projected by prospectors, the danger is proportionately increased. The attempt to return too soon after blasting has occasioned loss of life. The introduction of compressed air as a motive power in the larger mines is of signal service in this particular. After blasting the air is turned on, and the obnoxious gasses driven out before the men resume their labor. The candle test for unsafe air is observed by miners generally. The miners know that an atmosphere too poor in oxygen to support the flame of a candle is unfit to breathe, and precaution must be taken to avoid such localities when it is possible to do so.

They should also understand that this test is not infallible. There may be, and often is, an admixture of gases capable of supporting the flame from a candle, and yet deadly when inhaled. Experienced miners cannot have failed to note the behavior of the candle flame under these conditions. It flares up with a pale, bluish light, due to the presence of a gas known as "carbon monoxide." It is one of the most poisonous gases with which the miners come in contact. A product of imperfect combustion, it is generated by the detonation of explosive compounds, and being colorless, odorless and tasteless its presence is only made apparent by certain symptoms produced by its poisonous action, when introduced into the blood by continuous inhalation.

Associated in as small proportion as 1 per cent with the ordinary carbon dioxide, which infests mines, it may prove injurious. A combination of the two gases seems to increase the toxicity of each. Carbon dioxide is fortunately less active than the monoxide. It has a slight taste and odor, and can therefore be more readily detected. The two gases are generally associated together, and the chief concern is to be able to determine when their percentage in the atmosphere has passed beyond the limit of safety.

It is true that a difference exists among individuals in regard to their susceptibility to the action of these gases. One man may be overcome in a place where another suffers but slight inconvenience. This fact often encourages the latter to take unnecessary chances. Men of experience and judgment, however, rarely go into a place where the air is known to be bad without being prepared to retreat promptly upon the first indication of danger. What these indications are should be as familiar to the trapper as to the miner himself, for it is among the former class that accidents from inhalation of foul air is most liable to occur. Their work necessitates the handling of loose earth, which is more or less permeated by the gas, which is easily freed by the disturbance and becomes mixed with the air to be breathed. Poisoning by carbon dioxide is at times so insidious that the warning symptoms are unnoticed until too late to escape.

Symptoms of Poisoning by Carbon Dioxide.—The smell and taste of the gas are usually quite perceptible, and they indicate its presence when the percentage is small, when nothing more than a dryness of the throat and a slight headache may be experienced. In large amounts the headache becomes more intense, a peculiar throbbing pain is felt over the brow and back of the head. Vertigo supervenes, and the sight becomes dim and the limbs weak. There is nausea and vomiting. An uncontrollable desire to sleep comes on, and the person falls never to rise, unless carried out immediately. In an atmosphere completely saturated with carbon dioxide, these progressive symptoms are not noted, for the reason that all is over in a very few moments.

The effect is practically the same as being submerged in water. To rescue those who are insensible, a systematic plan of relief should be adopted. To rush in excitedly but complicates the work, very likely adding to the number already disabled. By forming a relay of men, and instructing the one who is to enter to apply a sponge or handkerchief saturated with water or, preferably, vinegar over the mouth and nostrils, then to go quickly forward, take hold of the one insensible, and drag him to the en-

trance as far as he can with safety to himself, then retire to give place to the one who stands ready to succeed him, will render the rescue work less hazardous to all concerned. Operating in a shaft is more difficult and dangerous. When the descent is made by a bucket for any considerable distance through a poisoned atmosphere, it is impossible to stand erect within it after the paralyzing effects of the gas is experienced. A sitting or kneeling posture should therefore be assumed, to avoid the possibility of falling from the bucket. Should descent by ladder way be undertaken, a rope fastened about the waist and manned from above is recommended as a wise precaution. A second rope may be lowered if necessary, and made fast to the person to be brought up by means of a loop drawn snugly around the body close under the arms. The act of hoisting an unconscious person by the aid of a rope must be conducted with reasonable care. The tension should be steady lest too forcible contact with jutting timbers or rocks result in serious injury. The resuscitation of those who have been overcome and rendered unconscious by inhalation of poisonous gases is necessarily first aid work. The question of how to accomplish this object must be considered. Little can be done before removal to a location where the air is comparatively fresh. Then cold water dashed into the face and friction applied to the limbs will stimulate the resumption of breathing. Should it fail to do so, artificial respiration must be resorted to at once. It consists of forcing air into the lungs by imitating the natural act of breathing. The steps of the procedure are as follows: Place the patient upon his back, with head and shoulders slightly elevated; loosen the clothing and cleanse mouth and nostrils; pull the tongue forward and bring it out of the angle of the mouth to remove all obstruction to the entrance of air. The operator then kneels at the head of the patient, and reaching forward, grasps the arms near the elbows, carries them up in an extended position. This manoeuvre creates a vacuum in the lungs, allowing air to enter, the arms are held in this position for two seconds, and then carried downward and pressed firmly against the sides, forcing air from the lungs by compression. This to and fro movement is kept up at the rate of 14 to 15 per minute, until there is a return of natural breathing, usually signaled by a voluntary gasp on the part of the patient. This is the most reliable of all methods of restoring suspended animation, caused by inhaling carbon dioxide. Air must be gotten into the lungs, either by the force or natural act of breathing. Otherwise the case is hopeless. This is true for physiological reasons, which cannot be discussed here. Suffice it to say that under normal conditions oxygen freely enters the blood by way of the lungs, and its presence there is essential to life. As soon, therefore, as the breathing becomes regular, the inhalation of oxygen gas may be begun and continued until the livid color of the skin becomes less marked, and consciousness returns. In the absence of the oxygen gas stimulants are next to be thought of, as soon as there is ability to swallow. Whiskey or aromatic spirits of ammonia are best. Ammonia has the property of quicker action, but is less durable than that of alcohol. Sniffing the fumes of ammonia is also useful. When patients begin to revive, there is apt to be cramping of the limbs, or general convulsions. This requires no treatment beyond protecting them from injuring themselves by the convulsive movements. The cases need watching for some hours, for it may happen that those who are apparently out of danger will suffer a relapse and become again unconscious, and die if left to themselves.

Taking the practical view that, with the best equipment and most efficient service, accidents may and do happen, the care of the injured must be considered with reference to their immediate necessities. To be prepared for emergencies is the first essential. This refers to the few medicines and appliances that may be needed for temporary use. These articles should be kept in reserve at the most accessible station within the mine, and plain and concise directions for their proper and legitimate indi-

cations posted in a conspicuous place, that all may have the privilege of learning how and what to do for others in case of need. To avoid unnecessary complications, the list of articles must be limited to the actual requirements, enumerated, it would appear, as follows. One-half dozen bandages, 2½ to 3 inches in width and 1 yard in length; one package of absorbent cotton, one roll of adhesive plaster, one dozen safety pins, galvanized wash bowl, soap and towel, temporary splints for the limbs, a litter, 1 cylinder of compressed oxygen gas with inhaling mask; medicines other than stimulants are not indicated. Two ounces of aromatic spirits of ammonia, with a small flask of brandy, are added for the latter. The medicines and dressings may be stored in a tin box with a tightly fitting cover, and the whole protected from moisture. After an accident the danger to be apprehended to those who are severely injured depends in a measure upon the length of time which must lapse before medical aid can reach them. This period varies from a few moments to several hours, according to circumstances. During this interval of waiting what is to be done? In some instances, nothing; in others, prompt action must be taken to save life. Upon those who are present, or first to arrive, devolves the duty of attending as best they can to the immediate necessities, whatever they may be. The demoralizing effect of an accident upon those who witnessed it is apt to be harmful in two ways; first, by causing delay when time is the important factor, and second, by inciting too energetic attempts at rendering assistance. It is therefore well to remember that, however alarming the situation, calmness and presence of mind is all-important.

Undue excitement contributes to render the chances of succor less certain, if not impossible. One who is competent to do the right thing whenever and wherever such service is imperative exerts an influence most assuring and helpful to those in peril, and to those who must assist in their care. Gentleness without timidity is of inestimable value in this service under all conditions.

In caring for the injured there are certain things to do, applicable in all cases. We begin by placing the individual in a recumbent and easy position, and proceed to loosen the clothing about the neck and chest, and if the patient is able to swallow and there is no excessive bleeding, external or internal, from wounds or concussions, a moderate amount of whiskey or aromatic spirits of ammonia may be given, as a temporary stimulant. If stunned and unconscious no attempt to give fluids by the mouth should be made, owing to the liability of their entering the windpipe and causing suffocation. Cold water may with advantage be sprinkled upon the face to excite effort at breathing. Friction applied to the extremities, being careful to select those which are injured, is a healthy measure. Heat applied externally is good when the surface of the body is cold and the circulation feeble. When reaction has become established the limbs should be examined, one by one, and in the same careful manner the chest, abdomen and head. In this way the injuries cannot fail to be noted. When there is dangerous hemorrhage caused by wounds and faintings from loss of blood ensues, appropriate means to control it must be employed promptly. To arrest bleeding, different methods are employed, all more or less mechanical. Pressure is the readiest and most effective means for the temporary control in urgent cases. To apply the fingers over the course of an artery and compress it sufficiently to shut off the current of blood requires but an instant, and this advantage in time is not to be overlooked, especially when a large vessel is wounded.

Troublesome bleeding from wounds in the palm of the hand is effectually checked by similar methods. Digital compression of the large arteries of the thigh is more difficult owing to the large mass of muscles by which it is surrounded. The limb should be elevated and a small, firm pad placed over the artery, then a handkerchief or piece of rope is made to encircle the limb over the pad, a sharp

stick introduced into the loop and twisted upon itself until the bleeding is effectually controlled.

Cold is an effective means of checking oozing from small twigs of arteries or veins. Ice, snow or cold water is placed in contact with the bleeding surface. Heat is equally serviceable, and is applied by means of compresses dipped in hot water. In deep wounds, when the source of bleeding is obscure and the condition of the patient is critical, packing the wound with strips of gauze or with absorbent cotton is permissible. After removing blood clots, the gauze or cotton is forced into the bottom of the wound and the cavity filled and a bandage firmly applied to the parts. In these manipulations absolute cleanliness is to be insisted upon to prevent infection. The hands of the operator should be thoroughly scrubbed with soap and water and the dressings kept as free from contamination as possible.

Internal bleeding, induced by serious injuries, is unfortunately not amenable to active treatments, and we must content ourselves with insisting upon perfect quietude, administering cool drinks and applying cold compresses over affected region. These simple means may appear insignificant and of doubtful utility in the presence of grave conditions, and the temptation to do something more radical in the way of treatment is at times difficult to resist. A moment's reflection should establish the fact that the immoderate use of stimulants or active movements of the patient tend to deviate the object we have in view, viz., to favor the formation of a clot at the point of rupture of the artery or vein. Nature's method of arresting hemorrhage—fainting—is a saving incident, and may be so regarded unless the weakness is progressive and the shock so profound as to threaten immediate death. In the latter emergency stimulation and warmth must be the treatment. It is to be understood that surgical skill is required to deal with such extreme cases. The suggestions above outlined are for the benefit of those who are uninstructed in the treatment of severe injuries. First aid implies only to the temporary care of those who are disabled and helpless; with that its utility ceases. Some injuries disable without endangering life, as instanced in the case of fractures of the limbs. Here some support is needed to steady the fragments during transportation.

The lifting and carrying of the injured is apt to be awkwardly done by men inexperienced in such service. Many injuries are of such a nature that misapplied force will further complicate the lesions which already exist, if, indeed, it does not lead to irreparable damage. A simple fracture of the leg may be converted into a compound one by injudicious handling. An unnecessary laceration of tissues is produced, and consequent suffering, besides adding to the gravity of the case. This is but one of the many things which may happen to the disadvantage of the patient during transportation. To lift an injured person properly requires three bearers. Two should stand upon opposite sides, in a position to support the upper part of the body, the third where he can conveniently take care of the lower extremities. Then, with the patient upon his back, all drop upon one knee, the two principal bearers pushing their arms under the back, lock hands firmly together. The third pushes both arms under the limbs. At a given signal all arise to their feet. The weight is thus so easily distributed as to be easily borne, and there is no appreciable jar or sudden twisting of injured parts.

A litter devised by the speaker is especially adapted for underground work, and insures absolute safety in whatever position it may be placed. By its use in mining accidents the difficult problem of getting those severely injured to the surface without discomfort or danger is satisfactorily solved. The litter, with its burden, may be put upon a cage or in a bucket, and when fastened in an appropriate position can be brought up without disturbing the position of the patient. A rope is attached to one end of the litter and a guy line to the other, the latter being used to steady it during transit. When the upright position cannot be maintained owing to syncope from loss of blood, a semi-horizontal or even reverse po-

sition may be chosen for the time being in order to allow the remaining blood to gravitate toward the heart and brain, an expedient that is sometimes useful in extreme cases. The fastenings are arranged so that the position of the patient is not changed with reference to the litter while executing the different movements of hoisting or transporting through narrow passages, thus affording additional security and dispensing with an extra number of bearers. In practice this plan was proven an excellent one. The litter is inexpensive and durable. After being brought up to the surface the injured are given over to the care of a physician or placed in an ambulance for conveyance to the hospital, and the duties pertaining to the first aid are practically ended.

In rendering first aid to the injured simple methods are to be preferred. They are always available and, moreover, within the comprehension of anyone possessed of ordinary intelligence, and can be easily put in practice by them at the time and place most urgently demanded. Officious and meddling interference is to be avoided. It is never necessary, and may do harm. There are certain definite things to be done in sudden emergencies. Common sense and prudence should dictate the course to pursue in every instance. The rule to do no harm is a good one, and should be kept in mind at all times. Its observance is never a cause of regret, but on the contrary, an evidence of a true desire to keep within the limits of safety—a most commendable qualification in the non-professional when called upon to take an active part in the care of the injured.

GREAT EXPOSITIONS AS AIDS TO MINING.*

A great exposition is a great educational institution. There has been quite a succession of them during the past half century, and each of the greater ones has been in a way more than those preceding it, more and more a real world's fair, where something of all the world's resources and wares were exhibited, and where some of all the world's folks were there to see and to be seen, and where one could in reality travel around the world in a day.

The Centennial Exposition at Philadelphia, 1876, was the first great national display of our manufactures and arts. At Chicago we had in this country for the first time a real exhibit of the natural resources of our own States and Territories. We were ourselves amazed at the variety and extent of these resources, and the amazement of the foreigners was even greater than our own. We saw there also the mineral products and manufactured goods from other countries. Then it was that we first realized that some day we might invade the world's markets; and leading men in Europe foresaw that America would some day lead as a world's power. Capital and men came into every State and Territory of this great West, and to a less extent into the South from the Eastern States and from abroad. Mine operators and metallurgists saw there new methods and processes, which have since lessened the labor and cheapened the cost of mining and reduction of their ore. Men of all professions there learned something of the complications and difficulties connected with the mining industry, and have since co-operated more cordially in legislation and other matters pertaining thereto. And men connected with our branch of the mining industry then came to better understand the difficulties and drawbacks, as well as the advantages connected with other branches of the industry. In other words, the Columbian Exposition in Chicago in 1893 taught the millions of American people who attended it, and through them the millions more who stayed at home, to know their own trade, to know their country, and to know the world in such a manner as to give a new light and new life to the nation.

For a year or two immediately following the Chicago Exposition the unsettled financial conditions

*Abstract of a paper read before the International Mining Congress, by Prof. J. A. Holmes, chief of Department of Mines and Metallurgy, Louisiana Purchase Exposition.

affected adversely mining and all other industries; but for the stimulating influence of this exposition on mining and other industries, however, this falling off in production would have been much greater than it actually was. And this supposition was without doubt in a measure responsible for the subsequent doubling of our mineral production and the creation of a general trade balance in favor of this country of \$600,000,000 per annum.

There has been about one world's fair for every decade during the last half century, and each has, in a way, represented the industrial, commercial and educational progress of the world at the time it was held.

In many respects each of the great expositions has been more of a world's fair than has the one which preceded it; and this will be emphatically true of the next great world's fair, for there will be brought together in St. Louis at that time not only the world of 1893, but also the world of 1904.

The great palace for the mining and metallurgical exhibits at St. Louis will cover nearly nine acres; and for certain exhibits of mining, milling and well-drilling outfits an out-of-door adjacent space nearly as great will be available.

The resources of all our States will be exhibited there, as will also those of Alaska, Hawaii, the Philippines, Porto Rico and Cuba, of Canada, Mexico, Central and South America, of Europe and of the Orient. Along with these exhibits of crude materials you will find there the manufactured products, and most modern equipment of all countries for exploiting and mining operations, and for the metallurgical treatment of these ores and other minerals.

These exhibits will teach the American public to have a greater respect for the miner and for the mining interests of this country. It will teach the miners a higher appreciation of the advantages and disadvantages of the different branches of their profession, and its relation to the other great industries of this country. It will bring the miner and the capitalist into closer and more satisfactory relations. It will help the introduction of new processes and equipment, and will in these and many other ways promote the mining interests of this country.

WHAT CONSTITUTES A MINE.*

In the broadest sense a mine may be said to consist of a body of ore sufficiently large and rich to pay the original purchase price, all of the costs of mining, reduction, plant and transportation, together with a large percentage of interest on the investment. In determining, therefore, what constitutes a mine it is necessary to consider each item of possible expense chargeable against the property, all physical and geological conditions, and such ore bodies as are developed, together with their bearing upon possible future ore bodies. Location of the property is likewise important. In this connection one must consider the availability of water, fuel and timber, the accessibility of the property, both for the purpose of shipping supplies to the mine and of marketing the ore or bullion. Dumping ground, mill and possibly even smelter sites have to be considered.

The geological and physical problems in connection with the determination of a mine deal perhaps more with the future of the mine than with its actual cash value. In this connection one must consider not only the enclosing rocks, their persistence and definition and influence upon the mineralization, but must take into consideration the fissure, and, if present, the fault systems because, in the majority of deposits the ore occurs in fissures and faults, as we say in "fissure veins." Fissures and faults are additionally important, because in many classes, as for example, contact and impregnation deposits, the continuity of the ore body must be determined. If faulted by intersecting fissures this must be known and the consequences determined. It is a fact that ore bodies are more often irregular in

*Abstract of a paper by G. W. Tower, Jr., read before the International Mining Congress.

dip, strike and form than otherwise, the valuable portion of the ore being controlled by some physical fact, such as the intersection of fissures with certain strata, or igneous rocks, or with each other. In a known mining district it is often possible by careful observation of these facts to calculate the exact position of valuable bodies of ore. In the district of Rico, Colorado, there are many vertical veins which intersect a great bedding fault or plane of disturbance, approximately parallel to the strike and dip of the strata. The mining in that district has demonstrated the occurrence of large bodies of rich ore at this point of intersection. So regular are these strata, the veins, and this fault in strike and dip, that within reasonable distances one can calculate the position of the ore body and some value for it without development. This, however, cannot be taken as the actual worth, because previous to sampling and measurements the exact value cannot be determined. In a very much simpler form the same condition of affairs, as far as value of property is concerned, exists in Butte. I would say that the great bulk of business which leads to the development of mines is done through lease and bond. The lease being for the purpose of opening and testing the property to see if it is worth the price which the bond calls for. The life of the bond is usually not less than one year.

The character of the ore above and below water is an important factor, because in most cases an entirely different method of treatment is necessary for the two ores. Above water level we have frequently high-grade ores that can be quickly and cheaply reduced by a simple mill upon the ground, whereas below water level the mill process may be involved and expensive or it even may be necessary to smelt the ores. These are important items in the cost of production because of the additional plant required and the uncertain factor of cost of reduction. Finally, from the geological standpoint it is necessary to consider whether the ores, even though sulphide, are primary or secondary. The geology of Butte, as exemplified by Emmons, Weed, Van Hise and others, shows that in many cases there is a zone in the vein wherein are deposited below water level very rich bodies of ore, which under normal conditions might be reasonably supposed to be permanent. Experience has taught us that, though the ores at depth are still profitable, even in the face of constantly increasing mining cost, due to the greater depth from which the ore is mined, they are not by any means the bonanzas they were.

Butte is not the only mining district to suffer in this respect, many of our precious metal mines and sulphide copper deposits having more or less striking examples of this phenomenon—a zone of oxidization, a zone of sulphide enrichment and a zone of permanent values.

We have been dealing with the future of mines perhaps too extensively, but let us consider upon what basis a mine should be bought and paid for. Recalling the definition given in the beginning of the paper, "A mine must contain ore bodies sufficiently large and rich to repay all charges against them, including capital invested and a large percentage of interest," would naturally lead to the question of how to determine these facts. It is manifest that the gross values are to be determined only by actual measurements of the ores blocked out, and the determination of the values by careful and conscientious sampling, with sufficient precautions and checks to assure the engineer that his results are absolute.

As ore bodies, like other bodies, have three dimensions, they can only be blocked out by actual development. These ore bodies must be cut and drifted upon at sufficient intervals to determine the length, size and form of the valuable shoots. It is rare that development is so complete that all the ore bodies can be treated with equal weight. It is, therefore, customary to divide one's estimates into three classes:

1. Ore technically in sight.
2. Ore reasonably in sight.
3. Ore that under the conditions existing should be expected with further development.

This done, it is but a step to a calculation of the gross value of the ore bodies.

The next step must necessarily be the determination of the methods of mining and treatment of the ores for all time and of whatever grade and kind. The low-grade and high-grade ores, the oxidized and the base ores, and to calculate the cost of converting them into cash.

The following is a reasonably complete summary of the charges which must be borne by a property before it can be considered a "mine":

1. Cost of mining, labor and supplies.
2. Cost of development, labor and supplies.
3. Cost of reduction, teaming (traming), milling, freight, smelting, losses in milling and smelting, commissions.
4. Cost of equipment of the mine.
5. Cost of equipment of the mill.
6. Cost of equipment of smelter (if advisable to build).
7. Cost of the mine.
8. Cost of possible litigation.
9. Cost of management.
10. The amount of interest on the money advanced for purchase and equipment at nominal rates, and, finally,
11. A large percentage of profit.

These costs are distinctly chargeable to the mine, and must not exceed the gross value of the ore, as calculated above.

This does not constitute the entire field that has to be examined. We in Butte have been compelled to look to our titles and our rights under those titles. We must determine after being satisfied that we have a legal title to our property, what is the extent of our rights in our own ground and outside of it. If we have extralateral rights and if there is a possible conflict of title to the very ore bodies in question through apices coming from other than the ground in question. While there are few camps that have ever been so busily engaged in litigation as has Butte, there is no district where such matters can be safely overlooked. Even Butte existed nearly 30 years without litigation.

THE MECHANICAL ENGINEER IN MODERN MINING.

Among the interesting papers presented at the meeting of the International Mining Congress, at Butte, was one by Mr. C. H. Repath, of Anaconda, on "The Mechanical Engineer as a Factor in Modern Mining, Milling and Smelting." Mr. Repath's paper was devoted to showing how mechanical devices had been substituted for manual labor, first in the mining of the ore, then to its transportation in the mine, to the surface, and from the shaft or mine mouth to the mill or smelter. He then demonstrated to what an extent mechanical appliances had been installed in connection with the concentration, milling and smelting of the ores, the handling of the product and disposition of the slag and other refuse, thus increasing the output and lessening the cost of production. Several of the mining and reduction plants in and around Butte were taken as illustrations of the points brought out in the paper, which unfortunately is too long to be published in full. Photographs of representative plants were shown in connection with the reading of the paper.

ENGINEERS ON THE METRIC SYSTEM.

A special committee of the Western Society of Engineers, to which was referred the question of the adoption of the metric system and the endorsement by the society of the bill before Congress providing for its use in Government transactions, recently made a very carefully considered report in favor of that measure. The conclusions reached are summed up in the following paragraphs:

"The countless transactions involving the use of weights and measures makes any proposition involving a change a most important one. The decimalization of our system of weights and measures has been proposed by a few who have failed to consider the

importance of an international system and the utter impossibility of the rest of the world adopting such a system as our own, however it may be improved in form. A change of this sort would be incomparably more radical than the adoption of the metric system. It has also been proposed to modify the existing system to one having a base of 8 or 12 on account of the possibility of continued binary subdivision, but here again not only is the importance of an international system overlooked, but the impracticable idea is proposed of combining such a system with a decimal system of numbers. When the base of our system of numbers is changed to some other than 10 it will be sufficient time to talk about a system of weights and measures having the same base.

"It should also be kept in mind that the metric system is just as capable of a binary subdivision as any other, although the advantages of such a division are only apparent in the most ordinary business transactions, and for the first few subdivisions. After the adoption of the metric system, the use of the half and quarter meter and a half and quarter kilogram would be as common as our half and quarter dollar—smaller quantities would be expressed in decimals precisely the same as in the case of our money.

"In 1866 Congress legalized the metric system. From that time on it has been growing in favor and in practical use. It is here to stay, not only in scientific work, but in commerce and manufacturing. It is now used by about two-thirds of the people of the world. Russia, Great Britain and the United States are the only non-metric countries. Russia has gone so far in the direction of its adoption that it may well be excluded from the list, leaving Great Britain and the United States. In both of these it has been legal for some time. Indications are that Great Britain will soon join the list of metric countries. Over 300 members of Parliament have already signified their willingness to vote to make the use of the metric system compulsory.

"Your committee believes the time has come for the gradual retirement of our confusing, illogical, irrational system and the substitution of something better. The first step in this direction should be the introduction of the metric weights and measures into the departments of the Government. The use of these weights and measures will simplify their work. It will familiarize the people with them and encourage their application to the common affairs of life. Your committee has no doubt that the benefits to be derived will far more than compensate for such inconvenience and expense as may be involved in the change."

TRADE IN FLORIDA PHOSPHATES IN 1902.

SPECIALY CONTRIBUTED.

The phosphate industry of Florida has shown much activity this year. In the hard rock section the movement is the heaviest on record and forward orders are large. Similar activity has been shown in the land pebble region. In the Peace River section preparations are being made for an increased output, to be consumed in domestic markets.

The competition abroad with Tennessee rock and foreign phosphate that was so detrimental in the past has subsided somewhat.

The shipments of Florida high-grade rock phosphates in the 7 months ending July 31 were as below, in long tons:

Destination.	1901.	1902.	Changes.
Austria	2,800	4,041	I. 1,241
Belgium	31,125	25,544	D. 5,581
England	11,360	17,358	I. 5,998
Germany	104,618	130,922	I. 26,304
Holland	42,753	35,621	D. 7,132
Ireland	1,975	6,050	I. 4,075
Italy	7,344	10,725	I. 3,381
Norway and Sweden	8,660	13,042	I. 4,382
Scotland	4,275	8,985	I. 4,710
Spain		2,950	I. 2,950
Total, Europe	214,910	255,238	I. 40,328
Honolulu		2,103	I. 2,103
Total	214,910	257,341	I. 42,431

The increase this year is equal to 19.7 per cent, due chiefly to the improvement in German trade.

The movement of Florida land pebble is summarized as follows, in long tons: Australia, 2,496 tons; France, 21,415 tons; Germany, 8,900 tons; Holland,

3,300 tons; Great Britain, 14,600 tons; Italy, 26,853 tons; Sweden, 15,435 tons; total exports, 92,999 tons. Adding domestic shipments of 112,706 tons, we have a grand total of 205,705 tons. Compared with the corresponding 7 months last year there has been a decrease of 8,296 tons in exports, which is more than equaled by an increase of 27,508 tons in the domestic consumption.

Peace River phosphate mining has been interrupted by a fire which destroyed the plant. A fine new plant is being erected, however, and as soon as completed the product will be taken by the American Agricultural Chemical Company, which has obtained control of the Peace River Phosphate Company.

Prices for high-grade phosphates show some improvement this year owing to a better understanding between the larger producers. Pebble phosphates, on the other hand, suffered from competition with the lower grades of Tennessee and South Carolina rock. Below we give a tabulation of the f. o. b. prices ruling during the 7 months this year, as compared with the corresponding period last year:

Month.	High-grade rock.		Land pebble.		Peace River.	
	1901.	1902.	1901.	1902.	1901.	1902.
January	\$7.25	\$7.50	\$4.14	\$3.13	\$2.94	\$2.38
February	6.75	7.50	3.93	3.13	2.63	2.38
March	6.75	7.50	3.93	3.13	2.63	2.38
April	6.75	7.41	3.93	3.13	2.63	2.38
May	6.75	6.75	3.93	3.13	2.63	2.38
June	6.75	6.75	3.93	3.13	2.63	2.38
July	6.75	6.75	3.93	3.13	2.63	2.38

Average ... \$6.82 \$7.16 \$3.96 \$3.13 \$2.68 \$2.38

This table shows an advance of 34c. per ton in high-grade rock prices and decreases of 83c. in land pebble, and 30c. in Peace River. The average price of all phosphates was \$4.22, against \$3.36 last year, showing an increase of 86c. in 1902.

It is interesting to note that export prices have been somewhat lower than last year owing to more favorable ocean freight rates. The average c. i. f. prices at United Kingdom and Continental ports this year were: High-grade rock, \$10.62 (\$10.64 in 1901); land pebble, \$7.06 (\$8.76 in 1901); Peace River pebble, \$5.97 (\$7.54 in 1901). The average for all grades this year was \$7.88, which compares with \$8.98 last year, showing a decrease in 1902 of \$1.10, partly accounted for by the cheaper freight rates.

Ocean freights from Florida ports or Savannah, Ga., were as follows: To Continental ports, \$2.40@ \$3.60 (\$2.64@ \$3.85 in 1901); Baltic, \$3.42@ \$3.96 (\$4@ \$5.04 in 1901); Mediterranean, \$3.34@ \$3.60 (\$4.20@ \$5.28 in 1901); United Kingdom, \$2.53@ \$3.12 (\$2.64@ \$4 in 1901). This statement shows a marked falling off in rates this year, one case alone amounting to over \$1.

COAL PRODUCTION IN THE URAL.—The congress of Ural mine owners reports a rapid increase in the output of coal, the output is still far from being sufficient to supply the demand for fuel. During the first four months of the present year the output of coal in the western and eastern Urals amounted to 213,600 tons, an increase of 61,560 tons, or 40.4 per cent, as compared with the same period of 1901.

AN OPEN SAFETY LAMP.—A German mining engineer named Ark, of the Muhlenbach Mine, near Ehrenbreitenstein, has patented an improvement in open safety lamps, which consists in the introduction of circular burners. In the body of the lamp a small pipe is fixed, and on this pipe the wick is fastened. The lower end of the pipe is in free contact with the air, so that fresh air can reach the flame freely, and thus render the combustion more complete. By this means smoke and soot are avoided and the illuminating power increased.

COAL PRODUCTION OF PRUSSIA.—The official statistics give the coal production of Prussia for the half-year ending June 30 as below, in metric tons:

	1901.	1902.	Changes.
Coal	49,828,383	47,594,568	D. 2,233,815
Brown coal (lignite)	17,966,766	16,832,640	D. 1,134,126
Totals	67,795,149	64,427,208	D. 3,367,941

The decrease was mainly due to the restrictions made by the district syndicates, in consequence of reduced demands from manufacturers. There were 272 collieries and 370 lignite workings reported this year.

SIR FREDERICK AUGUSTUS ABEL.

The death of Sir Frederick Augustus Abel, on September 8, at the age of 79 years, removes a chemist whose researches in the past have been of the greatest service to the mining world. While his work covered a wide range, the chemistry, composition, manufacture and behavior of explosives formed the special field in which he was for many years regarded as the highest authority.

Frederick Augustus Abel was born in London in 1827, and received his early instruction at home. He was one of the earliest to enter the College of Chemistry in London, and in 1846 was the first pupil chosen by Professor Hofman to be junior teacher and lecture-assistant. Subsequently he assisted Professor Hofman in that brilliant series of researches in the aniline derivatives that gave to the world the coal tar colors.

In 1849 he began a course of instruction in practical chemistry for the officers in the Royal Artillery, and the senior cadets in the Royal Military Academy in Woolwich; and on the retirement of Faraday in 1852 from the chair of chemistry at the Royal Mil-



SIR FREDERICK AUGUSTUS ABEL.

itary Academy, Abel was chosen to fill the vacancy. In this capacity his advice was frequently sought by the officials in charge of the government works at the various military depots concerning the production of war material, when the experiences of the Crimean war showed the importance of constant scientific advice and assistance in maintaining an efficient supply of armaments, munitions and equipments. The place of "Ordinance Chemist" was created in 1854, and the organization of that office was entrusted to Abel. His successful performance of that duty led to his promotion to still greater responsibilities as "Chemist to the War Department," in which capacity he continued until 1888.

During his administration, reforms were effected in the system of supplying materials to the establishments manufacturing war munitions, and improvements were introduced in the construction of works and buildings whereby proper standards of quality were established and maintained. Likewise the supply of food, clothing, illuminants, detergents and other material furnished to the army was made the subject of proper tests as to quality. In addition to these duties he was called upon to serve on a large number of special committees appointed by the War and other departments. It was in reply to a request of such character that he instituted those researches concerning the safe employment of petroleum, out of which grew the present elaborate system of testing petroleum and mineral oils and the establishment of the "Abel test" as the legal requirement in England and other countries.

He was also a member of the Royal Commissions on the preservation of the stone of the Houses of Parliament, on the causes of explosions, and spontaneous combustion in coal-laden ships, on noxious vapors, and on accidents in mines. His experiments in connection with the latter, extending over several years, and bearing on the relative merits of different safety lamps and on the part played by coal-dust in mine explosions, are embodied in his published book on "Mining Accidents and Their Prevention." This book was the outgrowth of a paper read by him before the Institution of Civil Engineers. It was subsequently revised and, with the discussions of the Institution on the subject, was published in book form; this being still considered an important and valuable standard work. Other books published by him were "The Modern History of Gunpowder," "Gun Cotton," "On Explosive Agents," "Researches in Explosives," and "Electricity Applied in Explosive Purposes." He was joint author with Col. Bloxam, of a "Handbook of Chemistry."

In 1888 he was relieved of the duties of chemist to the department, and was appointed president of a special government committee on explosives, in which capacity he was engaged in directing important work in connection with the application of smokeless explosives. In 1891, after more than 40 years of active public service, he retired, and since then has lived quietly, though he was frequently called upon for advice in the line of his past work. He remained to the end a student, and though his active work was over, he was always deeply interested in the researches to which he had given so many years of his life.

Sir Frederick received many honors in the course of his long and useful life.

The Companionship of the Order of the Bath was conferred upon him in 1877, and in 1883 he was knighted, and in 1893 he was created a baronet. The honorary degree of D. C. L. and D. Sc. were conferred upon him by the Universities of Oxford and Cambridge respectively. He held the presidency of the London Chemical Society, the Institute of Chemistry, the Society of Chemical Industry and the Institute of Electrical Engineers, and in addition to membership in other scientific societies, both at home and abroad, he had been vice-president of the Royal Society. He was also president of the British Association for the Advancement of Science and president of the Iron and Steel Institute, enjoying the unusual honor of holding the presidency of both those societies at the same time. He took an active part in the organization of the Imperial Institute in London, and was a director and honorary secretary of that body until his death.

SODIUM SULPHIDE ASSAY FOR ZINC.—The determination of zinc by titration with a standardized solution of sodium sulphide is the method commonly employed in European laboratories. In the United States the ferrocyanide method is most generally adopted, although a few chemists use the sodium sulphide. Prost and Haasreidter have called attention to the inaccuracy of the sodium sulphide method in the presence of iron, and proposed to offset it by the addition of a corresponding quantity of iron to the pure zinc solution used in the blank test. This has been further investigated by A. Coppalle, who has found that the presence of iron causes an error of — 0.33 per cent to — 1.16 per cent, increasing according to the proportion of iron present (*Ann. Chim. anal. appl.*, VII, 94 to 96, and *Chem. Centr.*, 1902, I., xvi., 951). These results show that it is necessary to add iron to the pure zinc solution used in the blank test. E. Prothière has pointed out the inaccuracy of acetate of lead paper as an indicator chiefly because of the coloration of the latter before the zinc is completely precipitated. He recommends the use of a paper saturated with a 5 per cent solution of tartar emetic, which remains colorless until the zinc has been completely precipitated, when a fine yellow stain is produced instantly. The prepared paper may be preserved indefinitely, after drying in the air, and is claimed to be very sensitive. (*Journ. Pharm. Chim.*, XV., ix., 419 to 422.)

CHARANPORE COLLIERY, BENGAL.*

Charanpore lies about 137 miles from Calcutta, and is connected with the East Indian Railroad by the "Sitarampore-Topsi" extension, a siding from which runs into the colliery.

It is about thirty-five years since this colliery was opened. There are two seams of coal, viz.: the Charanpore, or top seam, and the Seebpore, or bottom seam. The former is 10 feet thick and the latter 18 feet. For some years the top seam only was worked, and it was not until 1882 that the bottom seam was opened up.

The superiority of this seam was so marked that the top seam was abandoned. The Seebpore seam,

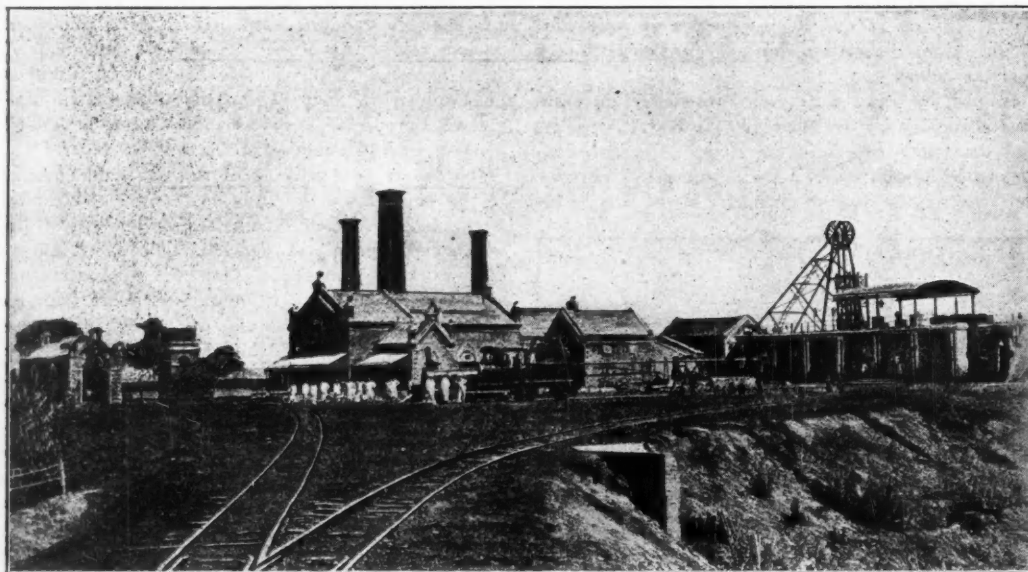
The pumps below consist of one pump 20 inches by 8 inches and one 18 inches by 9 inches water delivery; there are also smaller stand-by pumps by the same makers.

The mine top is fitted up with the latest class of tipples, so as to get the coal away as quickly and cheaply as possible. The coal for the boilers is tipped direct from the pit top into the coal bunkers in the boiler room, and the arrangement for getting rid of the boiler ashes is novel. As the ashes are raked out of the furnace they fall through a grating into a tram below and are taken away; by this arrangement the boiler house is always kept clean and free from dust. The cages are fitted with safety

fan capable of circulating from 150,000 to 200,000 cubic feet of air per minute through the workings.

The two mines are connected below, and the system of pumping is such that No. 2 catches most of the surface water; by this arrangement the main pumps at the former pit are greatly relieved. There is a battery of five Lancashire boilers at No. 2 that supply steam to the winding engine and pumps, both in the bottom seam and the top seam abandoned workings, also for the workshops, etc. All the Lancashire boilers in the colliery were made by Messrs. Apcar & Co.

The collieries and the whole of Messrs. Apcar & Co.'s property in the mining district are under the general managership of Mr. Frank Agabeg, who has designed and laid out the works, and one has only to look at the illustrations to see how successful he has been.



CHARANPORE COLLIERY, BENGAL. MINE NO. 2.

as is well known, produces some of the finest steam coal in India.

Messrs. Apcar & Co., among the pioneers of Indian coal mining and owners of the property, were the first to throw over the old style of transport—the cow cart—and as Charanpore then was over five miles from any railway, it was patent to them that if they were to make their colliery a paying concern a quicker means and a cheaper means of transport was necessary. Having this in view, they, in conjunction with the owners of Seebpore Colliery, at that time Messrs. Shib Kristo Daw & Co., constructed a 2 feet 6 inches gauge tram line, five miles long, to Asansol.

This line was well laid with steel rails of 35 pounds to the yard, and the rolling stock consisted of 4-ton low-sided cars of the State railway pattern. The illustration of mine No. 2 shows the type of locomotive in use on this line.

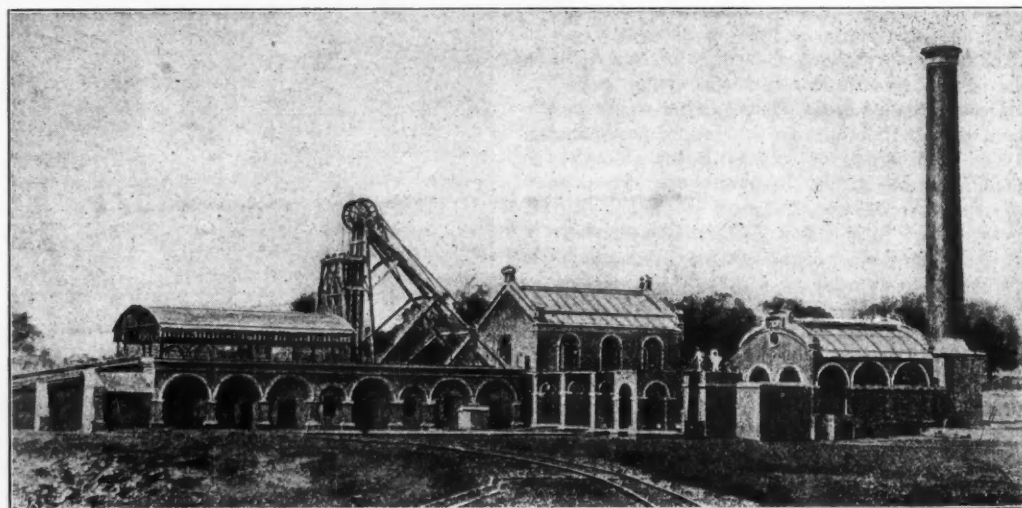
The line served the colliery for over 20 years, until the East Indian Railroad constructed their Topsi extension, when Messrs. Apcar & Co. gave up dispatching coal to Asansol and laid a siding from the extension into the colliery.

Charanpore furnishes an illustration of what can be done in the way of manufacturing mining plant, as the whole of this colliery is fitted up with plant made by Messrs. Apcar & Co. at their Albion foundry.

One has only to see the beautiful winding engines and boilers at the Apcar Mine to arrive at only one conclusion, and that is, that work of this class can be turned out just as well in India as elsewhere.

The Apcar Mine, recently opened up, is 375 feet deep and passes through the Charanpore or top seam at 275 feet. This mine is fitted up in the most approved style. The winding engines consist of a pair of double cylinder horizontal 12 inches by 24 inches stroke, fitted with a 6-foot drum and made by Messrs. Apcar & Co. The boilers are of the Lancashire type, 36 feet long and 7 feet diameter, with a working pressure of 100 pounds. There are two boilers up at present, but later on, as the work proceeds, it may be found necessary to put up another one.

*From *Indian Engineering*.



CHARANPORE COLLIERY, BENGAL. APCAR MINE.

detaching hooks in case of an over-wind, and run between steel wire guide ropes held taut below by weights. This system of weights always ensures the guide ropes being taut. The tubs are capable of carrying a load of 14 hundredweight each, and the gauge of the tram below in the mine is the same as above, viz.: 2 feet 6 inches. A good arrangement of water-supply for the use of the miners has been put up. There is also a shed built for those men who come from a distance to have their food in; a thoughtful arrangement, especially during the hot weather and the rains.

What strikes a visitor most at this colliery is the cleanliness that prevails everywhere, both below and above ground. Standing in the engine-house of the Apcar Mine one would imagine that he was in the engine room of some smart liner; everything being so well kept. All the mine fittings, including the head gear, which the reader can see is a very graceful one, have been made at the colliery.

Mechanical ventilation will be adopted at this pit very shortly. It is proposed to fit up a "Sirocco"

tomatically reversed and the rabble is thereby caused to move backward, the rake blades being then of course turned to a horizontal position. The rabble remains always in the furnace. It consists of the two side bars, which are open at the top, like troughs, and three hollow transverse bars, the middle one bearing the rakes. The side bars and the transverse bars are kept full of water, the loss by evaporation being automatically made good after every trip through the fire. The rakes are set so as to insure a thorough stirring of the ore and the rabble is so designed as to prevent any pinching of the racks with the spur wheels upon which they travel.

NEW IRON MINES IN NORWAY.—The *London Engineer* has advices from Christiania, Norway, stating that great veins of iron have been discovered in the neighborhood of Vadso. Experts consider the deposits rich, there being veins covering a field of square kilometers. It is said that a great part of the ore tested contains from 50 to 60 per cent of iron.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

RIGHTS OF ASSIGNEE OF OIL OPTION.—The assignee of an oil option is not bound by the fraud of his assignor in procuring the contracts, though the grantors are in possession and the rights claimed under the option are consistent with such possession.—*National Oil and Pipe Line Company v. Teel* (67 *Southwestern Reporter*, 545); Court of Civil Appeals of Texas.

CONTRACT FOR HAULING.—A contract stipulating that the first party shall have the hauling of all ore up to 15,000 tons and not less than 10,000, as required by the second party, does not bind the latter to supply more than 10,000 tons.—*Haggerty v. Lenora Mt. Sickler Copper Mining Company* (9 *British Columbia Reports*, 6); Supreme Court of British Columbia.

MECHANICS' LIEN.—A blacksmith employed for the sharpening and keeping the tools in order for the work of mining is entitled to a lien for his wages on the mining location; but a cook who does the cooking for the men employed is not entitled to a lien. Adjoining mining locations, when they are water lots, if "enjoyed" with the mining location on which the mine is situate are subject to liens for the work performed on the mine.—*Davis v. Crown Point Mining Company* (3 *Ontario Law Reports*, 89); Ontario Divisional Court.

WHEN NOT LIABLE FOR ACCIDENT IN UNUSED PART OF MINE.—The failure to fence off an unused part of a mine, though required by law, does not render the owner of the mine liable for death of a miner killed in an explosion in that part of the mine, where he was sent into such unused portion to perform certain work there, and the failure to fence it off did not in any degree tend to cause the explosion.—*Grant v. Acadia Coal Company* (34 *Nova Scotia Reporter*, 319); Canada.

LIABILITY FOR CONTINUANCE OF CARELESS EMPLOYEE.—In an action by the parents against a mining company for the death of their son, resulting from alleged negligence in blasting, a verdict for them will be affirmed, where it appears that the man that the company employed to direct the blasting and to notify employees of the blasts did not notify deceased; that such party came to the company with the reputation of being careless and reckless in blasting, and that frequent complaints of his carelessness had been made by other employees to the general superintendent of the company.—*Stasch v. Cornwall Ore Bank Company* (19 *Pennsylvania Superior Court Reporter* 113); Superior Court of Pennsylvania.

WHO ARE NOT "FELLOW SERVANTS" OF MINERS.—A miner is not a fellow servant with one employed as a "tool carrier," whose only duty is to take sharpened tools into the mine and throw them off at the various levels, and bring up the dull ones. The laws of Utah (Revised Statutes, sec. 1443) provides that all persons who while in the service of any one, are in the same grade of service, and are working together at the same time and place and to a common purpose, neither of such persons being intrusted by the employer with any superintendence or control over his fellow employees, are fellow servants with each other. It was held that a miner is not the fellow servant with one whose duty it is to manage and operate a cage by which the miners are conveyed in and out of the mine. Also, where an injury is the result of two concurring causes, and the employer is responsible for or contributed to one of them, he is not exempt from liability because a fellow servant who is responsible for the other cause may also have been culpable. An employee assumes the risk and negligence of a fellow servant, but not that of his employer.—*Jenkins v. Mammoth Mining Company* (68 *Pacific Reporter*, 845); Supreme Court of Utah.

CONSTRUCTION OF CONTRACT—SALE OF MANUFACTURE OF IRON.—A hardware company and a steel company entered into contracts by which the former agreed to buy and the latter to sell and deliver certain quantities of round and angle iron, to be delivered from time to time as specified by the first party, but all prior to a fixed date. The contracts contained a provision that the steel company should not be liable for any loss or damage arising from non-fulfillment by reason of strikes, fire, etc., and a further and separate provision that the "sellers are permitted, if they desire, to transfer this contract to any manufacturers of reputable standing." The steel company was the owner of an iron mill, and its business was the manufacture of iron such as that covered by the contracts. It was held that the contracts were to be construed with reference to such known facts, and were for the manufacture and sale of goods, and not merely of bargain and sale; that, on destruction of the iron mill by fire before the contracts were fully performed, it was absolved from further performance, and was not required to purchase the iron elsewhere, or to transfer the contracts.—*Western Hardware and Manufacturing Company v. Bancroft-Charnley Steel Company* (116 *Federal Reporter*, 176); United States Circuit Court of Appeals.

"ORDINARY CARE IN MINING OPERATIONS.—Ordinary care implies and includes the exercises of such reasonable diligence, care, skill, watchfulness and forethought as under all the circumstances of the particular service a careful, prudent man or officer of a corporation, would exercise under the same or similar circumstances. By the terms "same circumstances" is meant to include all circumstances of time, place and attendant conditions. And, where a miner, descended a ladder used in going to and from his work, and on stepping off the last rung fell into a hole made and left open by the foreman without such miner's knowledge, an instruction that where a mining company, in the prosecution of its work, is putting timbers and floors to catch ore as it is broken down and distribute it to various chutes, and the floors are being changed from time to time to keep, up with the work, such floors and timbers and passageways are to be deemed the work itself, and not the place of work, or the means of ingress and egress, within the rule requiring the employer to keep them reasonably safe, was not correct and was properly refused. *Downey v. Gemini Mining Company* (68 *Pacific Reporter*, 414); Supreme Court of Utah.

RIGHT TO INSPECT MINE UNDER ORDER OF COURT IN MONTANA.—The law of Montana (Code Civil Proceedings, section 1317) provides when a person has a right to or interest in a lode or mining claim, in the possession of another, and it is necessary for the ascertainment of that right that there be an inspection of such lode or mining claim, or when an inspection or survey is necessary to ascertain the right of any person in another lode or mining claim, and the person in possession shall refuse such inspection or survey, the party desiring it may present a petition setting out his interest, on which an order for inspection or survey may be had. It was held, to entitle one to an inspection of a claim for the purpose of ascertaining or enforcing his right or interest in another claim, he must have an interest in the first claim, and that the right of one owning a claim to follow a lode having its apex therein into another claim is not such an interest in the latter claim as to authorize his inspection and survey of it. Equity has no jurisdiction independent of statute, and in the absence of a suit, to order inspection of property. Inspection should not be granted of a mine not described in the petition, under authority of section 1317. The order authorized should be limited to the necessities of the case, and explicitly state how far it may go. Under authority of this law, all the appliances in use for ingress or egress may be made available for the persons making the inspection.—*State v. District Court, etc.* (68 *Pacific Reporter*, 570); Supreme Court of Montana.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the *ENGINEERING AND MINING JOURNAL*.

The Journal of the Canadian Mining Institute, 1902. Edited by B. T. A. Bell, Secretary. Ottawa, Canada; published by the Institute. Pages, 650. Illustrated.

American Water Works Association. Proceedings of the Twenty-second Annual Meeting, 1902. Elmira, N. Y.; published for the Association by John M. Diven, Secretary. Pages, 364; illustrated.

The Treatment of Steel. Compiled for and published by the Crucible Steel Company of America. Pittsburgh, Pa.; Third Edition. Pages, 160; illustrated.

Materials of Machines. By Prof. Albert W. Smith. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 148; illustrated. Price, \$1.

Handbook to the Mining and Geological Museum, Sydney. By George W. Card, Curator. Sydney, N. S. W.; Government Printer. Pages, 204; illustrated.

Twelfth Census of the United States, Volume VII. Manufactures. Part I. United States by Industries. Prepared under the supervision of S. N. D. North, Chief Statistician for Manufactures. Washington; United States Census Office. Pages, 697; illustrated.

United States Geological Survey. Production of Manganese Ores in 1901. By John Birkinbine. Pages, 33. *Production of Lead in 1901*. By Charles Kirchhoff. Pages, 16. Washington; Government Printing Office. Pamphlets.

BOOKS REVIEWED.

Information as to Mining in Rhodesia. 1902. London, England; compiled and published for the British South Africa Company. Pages, 466; with maps.

This is one of the manuals which the British South Africa Company issues from time to time for the benefit of prospectors, miners and investors whose attention may have been drawn toward its Rhodesian territory. It contains descriptions of several mining districts and of individual mines; maps of the mining territory, and lists of companies organized. Reports and other information about work actually done and its results are also included.

Statistical Notes on Lead, Copper, Zinc, Tin, Silver, Nickel, Aluminum and Quicksilver. 1901. Compiled by the Metallgesellschaft and the Metallurgische Gesellschaft, A.-G. Frankfurt-am-Main, Germany. Pages, 64.

This carefully compiled manual, which has been issued for a number of years past, is generally recognized as of great service to all engaged in the metal trade. The present issue resembles the preceding one in form, and presents statistics of the production and consumption of the metals named in the title. Long experience and familiarity with the trade have enabled the compilers to prepare these statistics in a way which enables the reader to obtain a clear idea of the course of the trade in the various metals. The information is given in a condensed form, largely in tables, which makes it convenient for reference.

University of Texas Mineral Survey. Bulletin No. 3. Coal, Lignite and Asphalt Rocks. Austin, Texas; published by the University. Pages, 140; illustrated.

The purpose in preparing this *Bulletin* was mainly to present in a convenient form reliable data concerning the deposits of coal, lignite and asphalt rocks found in Texas. Geological considerations have been given a secondary place, in order to bring forward

as much as possible the economic situation with regard to the utilization of these materials. The *Bulletin* is a joint production of Dr. Wm. B. Phillips and Messrs. R. C. Brooks, B. T. Hill and H. W. Harper, each of them preparing a portion of its chapters.

Natural gas has not been included, because its production and use in Texas thus far is very small, although it is known to exist in certain localities. The fuel question is now attracting a great deal of attention in Texas on account of the industrial progress of the State and also because of the development of large supplies of fuel oil. The condition of the lignite industry at present is not very good. A number of mines have been closed down, principally on account of the competition of fuel oil, which is felt in the case of these mines much more than by those producing a superior quality of coal. Prices have been so low that in many cases it has not paid the companies to continue work, especially as a number of them are small concerns of limited capital. The cost of mining, however, is generally very light, while most of them are advantageously situated with regard to transportation. With the inevitable increase in the price of oil, which must be expected, the lignite mines will have a much better chance and may hope for more profit in the future. One object of the present *Bulletin* is to determine as far as possible by tests and analyses the value of Texas lignite as fuel and to make the facts generally known. The data have been insufficient heretofore, and even now much is needed to determine the actual facts in the case.

Of the five chapters in the present volume the first treats of the location of the coal and lignite mines and of the different classes of coal produced, giving also a number of analyses of these coals. A very valuable table showing the composition and heat values of the different coals mined in the State is given, showing in a compact form some facts never presented before. The second chapter discusses heat units, the method of calculating them and the methods of testing coal, and also discusses at some length the comparative values of coal and oil as fuel. The question of railroad freights on the different fuels is also gone into very carefully. The remaining three chapters are devoted to asphalt rocks, treating respectively of their location, occurrence and distribution; of the actual production and of the uses of these rocks, and finally of their chemistry and relative values for the purposes for which they are employed. The *Bulletin* has much practical value, which will doubtless be appreciated by those for whose especial use it was intended.

United States Geological Survey. Twenty-first Annual Report. Geography and Geology of the Black and Grand Prairies, Texas. With Detailed Descriptions of the Cretaceous Formations and Special Reference to Artesian Waters. By Robert T. Hill. Washington; Government Printing Office. Pages, 666; illustrated with six large maps, 55 plates and 80 text figures.

This work is a complete monograph of one of the most important geographic provinces of the United States, comprising the Black and Grand Prairie regions of Texas, conspicuous for their rich soils and their peculiar geological conditions, due to the chalky nature of the sub-structure.

Part I. of the volume treats of the geography of the Texas region, showing its classification into provinces, the relief, the mountains, plains, drainage, etc. Part II. is a presentation of the geography of the Black and Grand Prairies and the peculiar strips known as the Eastern and Western Cross Timbers. These are here defined and described with great minuteness. Part III., which is entitled "The Geology of the Black and Grand Prairies," is practically a monograph upon the cretaceous formations of the Texas region, and, inasmuch as this is the most complete section of the rocks of the cretaceous period to be found in continuity in any province of the world, embracing all the horizons, from the lowest to the uppermost, and as these formations practically constitute the structural basis of

much of the topography, the source of most of the soils, and the matrix for many of the rich metalliferous deposits of the Texas and Mexican region, their presentation in such minute detail is of great importance. Furthermore, it is owing to their structure and composition that the artesian water conditions of a large area of Texas are due. They also contain building stones of many interesting species, and chalks, chalky marls and clays, which will be of value in the portland cement industry, as well as beds of flint suitable for all the uses to which that material, now largely imported, is applied. This portion of the work is chiefly interesting, however, from the fact that it gives a complete and clear classification of the Cretaceous formations of Texas, a monumental task to which the author has devoted a large part of his scientific career. Each of the formations is described minutely and its occurrence and distribution discussed. Furthermore, accompanying each formation are half-tone plates, showing the character of the rock structure, its resulting topography and the common fossils, which will enable any one to readily identify the geological position. In addition to this attempt at a simple presentation for the people, the author has not omitted the important technical questions, which include discussions of the underlying rocks of the Black and Grand Prairies, including a summary of all the knowledge of the pre-Cretaceous strata of the region; the description of how the basement sands of the invading Cretaceous sea transgressed time diagonally; the minute correlations of the various local sections, showing the variation in composition of sediments of similar age in different parts of the region, and many chapters such as that upon the Woodbine (Dakota) formation, which represent years of careful study and classification, and, for the first time, present to the student of geology an understanding of many hitherto unsolved problems.

Parts IV and V deal with the artesian waters of the Black and Grand Prairies, and are intended as practical illustrations of the fact that the structure and arrangement of the rocks, as well as their composition, are of the utmost importance in their influence upon culture. In the region under discussion, with the formations properly mapped, described and defined, together with a presentations of their dip and sequence, it is now possible to estimate with great accuracy the depth of artesian waters beneath any given point.

Part V is a clear presentation of the principles governing the occurrence of underground water, showing the nature of rock saturation and the geologic factors bearing upon earth water, capacity of rocks for absorbing moisture, the flow of water through rocks and the influence of stratification on distribution of underground water. Incidentally there is introduced on page 395 a discussion of the various artesian well systems of Texas, showing with great clearness the areas of probability and impossibility. The numerous artesian reservoirs underlying the Black and Grand Prairies are defined on pages 420 to 427, while the remainder of the work takes each one of the counties within the area and gives in a concise manner all that is known of its geology, the records of all the wells hitherto drilled in them, and the depth to the various artesian reservoirs beneath them. In all the records of hundreds of wells are here published, after proper classification and study, in a manner that each one becomes a most useful and valuable lesson to the public. The value of these county descriptions are incidentally shown on page 620, where a plate is published showing how the citizens of Denison could obtain a supply of artesian water, and on page 604 demonstrating how Dallas, which is now suffering from inadequate water, by going a few hundred feet further, could obtain a purer and more abundant supply.

Inasmuch as the total area discussed is equivalent to 40 of the atlas sheets of the United States Geological Survey, the book will be valuable to prospective oil drillers within the territory, who should consult these rocks before blindly sinking wells. It might be mentioned, by the way, that in the description of Navarro County, pages 640 to 644, a com-

plete section of one of the Corsicana oil wells is given for the first time.

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

Zinc Ore from Kentucky.

Sir:—In your issue of August 30, under the heading of "Missouri—Sullivan County," you publish an item: "A train load of zinc ore shipped to Iola from the Old Jim Mine, near Marion, etc. . . ."

The Old Jim Mine is in this county—Crittenden County, Kentucky, and the ore shipped from here to Joplin, not to Iola, Kan. The raising of zinc ore and galena is commencing to be very great, the Old Jim since its discovery, a year ago, having shipped over 9,000,000 pounds.

D. C. ROBERTS.

Marion, Ky., Sept. 4, 1902.

Coal Briquettes in Germany.

Sir:—Referring to your publication in the *JOURNAL* of August 23 of a note on "The Manufacture and Use of Briquettes in Germany," permit me to draw your attention to the fact that the total output of briquettes is very considerably larger than stated, and I think that Consul General Mason only gave figures concerning one syndicate. The total amount of fuel briquetted outside of peat in Germany is near 9,000,000 metric tons. One concern alone, the Westfaelische Kohlen Syndicate, employed last year over 90 presses and used nearly 100,000 tons of pitch (obtained from by-product coke ovens), and produced about 1,500,000 tons of briquettes. The output of the gigantic brown coal briquetting plants near Cologne (at Liblar, Gruhl and Horem), aggregated about the same, and it is expected to reach 3,000,000 tons before very long. Germany's briquetting industry represents about 40 per cent of the total European output.

The amount stated in Mr. Mason's report—749,208 tons—as consumed by the railroads, refers only to the Prussian state railways. This amount was contracted for in 1902, and is mostly used for car-heating. The briquettes used are rectangular blocks 4 by 4 by 8 inches, and are made on conifal-type presses.

Readers will readily realize that Mr. Mason's remark that "Briquettes form the principal domestic fuel of Berlin and other cities and districts in Germany" could hardly hold good of a total of 1,643,416 tons of briquettes per year only.

R. SCHORR.

San Francisco, Sept. 2, 1902.

Mining Opportunities in Guatemala.

SIR: In the issue of August 2d appeared a question as to opportunities in mining for a prospector in Guatemala. As I lived in the country for about three years, I might give you some items of special interest to the inquirer.

As far as I know, the time I lived in that Republic, a miner had to have Government licenses and concessions to prospect and work his claims, all the metal mined being delivered to the Government, which settled its value. This principal hindrance is not the only one, the Government never failing to tax miners heavily. At present there are no mines of importance worked to any extent. The most promising part of the country for mining is without doubt the gigantic Sierra de las Minas, a beautiful mountain range in Northern Guatemala. It is covered on its northern side by heavy forests of hard woods, and has abundance of water for generating power. There are several workings of the Spaniards, and Indians know of rich hidden mines. At the foot of the Sierra, in the cañon of the Rio Polvochic, the Ferro Carril de Alta Verapaz winds along the river banks and connects the towns of Tukurú and Panzós. From Panzós the traffic is carried on by steamers, down the Rio Polvochic over the Lago de Izabál, a large beautiful lake, to Livingstone, the harbor on the Atlantic coast. At earlier times

a country road connected the city of Guatemala with Izabál, a town on the Izabál Lake, and from the latter place steamers went to Livingstone. The Ferro Carril del Norte, a railroad running between Guatemala and Puerto Barrios (Atlantic harbor) is nearly completed. In May the rainy season sets in, and continues until October. The rain is very heavy in Guatemala, roads oftentimes having washouts, so as to suspend traffic.

The country itself, it seems to me, has unique features for mining, all the necessary water and wood being available and transportation facilities easy to obtain; but the mining law restricts profitable mining.

I should not advise the small prospector, who goes to a country with a view to working his claims in a primitive way and on a small scale, to make Guatemala the field of his work and ambitions. A heavily capitalized company would, I believe, have some prospect of success in the Republic, having greater facilities for securing concessions and obtaining better terms favorable to mining. At present Guatemala is suffering in a business way, and it is not advisable for anybody to go there until existing conditions give place to more prosperous ones.

Torreón, Mex., August 10, 1902. H. HAAS.

"Pillows" or "Pillars."

Sir: I notice in the article on "Preservation of Life in the Witwatersrand Mines," in your issue of August 30, that your correspondent says: "In places where the roof is really bad the best practice here is to leave 'pillows' in the stopes . . ."

Now, this has puzzled me a little, and I would like some explanation. Am I to infer from this statement that the Witwatersrand mine-owners kindly provide pillows on which the miners can repose their weary heads and forget the dangers besetting them? Or, possibly, is it the intention that the pillows are to be used as protectors, and that the miners can get under them when the roof falls, and thus save themselves from injury? In either case it would be a novel and interesting application of the domestic pillow. I doubt, however, whether such uses could be extended to our own mines, but am not sufficiently familiar with South African mining to judge of customs there and their results.

On second thought, it occurs to me that your author—or printer—might have intended "pillars," not "pillows." If such is the case, please relieve my mind, and spare me the making of further conjectures.

INQUIRER.

Leadville, Colo., Sept. 5, 1902.

(Our correspondent's second thought in this case is better. The compositor made "pillows" out of "pillars," with his usual perversity.—EDITOR E. & M. J.)

QUESTIONS AND ANSWERS.

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

Copper in Copper-Bearing Pyrites.—What percentage of copper is necessary to make copper-bearing pyrites profitable to mine?—F. W. G.

Answer.—This question cannot be answered generally. It depends entirely upon the nature of the deposit, its extent, the probable cost of mining, the location and other factors. A percentage of copper which would pay in one place might be entirely too low in another. Your best course is to have the property examined by an expert.

Mexican Mining Dividends.—Can you tell me how dividends on Mexican mines are paid, whether monthly, quarterly or otherwise?—C. S. B.

Answer.—There is considerable difference in the way of payment by Mexican mines, just as there is with our own. The majority of the large mines—such as the Cinco Senores, the Augustias and others—pay monthly. It is in fact the general custom to

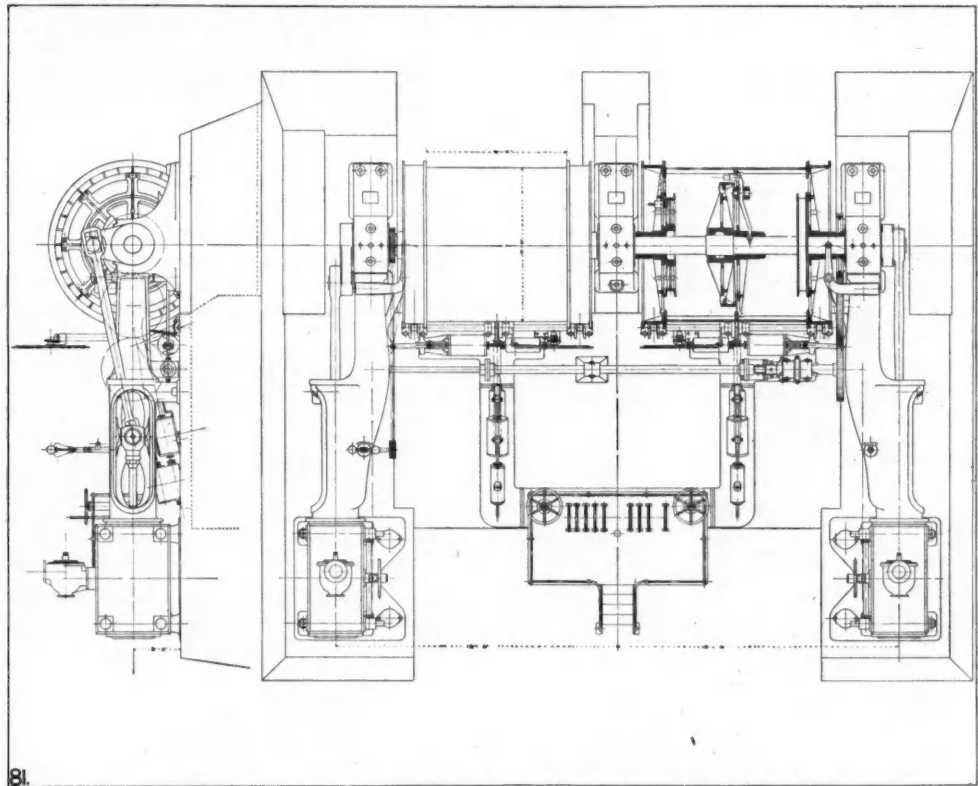
pay monthly, rather than at longer intervals. There are, however a number of companies which are less fortunate, and pay dividends at irregular intervals, whenever they may accumulate sufficient surplus.

Instruments for Finding Ore.—We know that there are instruments in the market and for sale which are used for locating bodies of ore, such as gold, iron, silver and copper. Will you kindly inform us if there is an instrument which can be used for locating zinc and lead ore, and if so, where can we obtain information regarding the same?—B. Z.

Answer.—The magnetic needle is used sometimes for locating deposits of magnetic iron ore. For locating gold, silver, lead, zinc and other ores there are no instruments. Such things have been advertised from time to time, but their supposed inventions are based on a fallacy and are of no real use. The claims made for them have always proved baseless when submitted to practical tests. The pick and drill, or

ing Company's mines, near Ely, Minn. This plant presents a striking appearance, occupying a floor space of 42 by 32 feet, and being of very powerful and heavy design, complete in every detail. Its total weight is 176 tons. It represents the most advanced type in hoisting machinery for the iron mines of Michigan and Minnesota, and is thoroughly modern in construction. The hoist is of the double drum, direct acting type, the drums being loose on the engine shaft, and driven with band and friction clutches. Two hoisting shafts are operated by the hoist, each drum hoisting in balance from the two compartments of one shaft.

The drums are 10 feet in diameter, with 9-foot winding faces, provided with spiral grooves for 1 3/8-inch rope. The gross load which each drum is capable of lifting is 29,000 pounds, and 7 tons of ore will be raised at each trip. Each drum is provided with two heavy band or strap brakes, which operate simultaneously. The powerful band friction clutches



NEW HOISTING DRUM AT SAVOY AND SIBLEY SHAFTS, ELY, MINN.

the diamond drill, in intelligent hands, are the only tools that can be recommended.

Prospecting for Iron Ores.—We have to prospect for iron ores at a point where samples from the outcrops show as high as 65 to 68 per cent iron, free from any deleterious contents. The local conditions make prospecting work expensive, and, moreover, we do not care to call attention to our work. We have heard much about the use of the prospecting or dip needle, and would like to know where we can procure such instruments in Europe, as that would be most convenient for us.—C. M. A.

Answer.—The dip needle is used in prospecting for iron ore occasionally. It will be of value to you, however, only if your deposit is magnetite or magnetic iron ore; otherwise it will be of little or no use.

You can obtain these instruments from any good instrument maker in Germany or Great Britain. Among the latter we might mention W. F. Stanley & Co., Limited, Great Turnstile, Holborn, London, and A. G. Thornton, 77 St. Mary's street, Manchester. You can obtain other names from the English and Germany papers.

A NEW HOISTING DRUM.

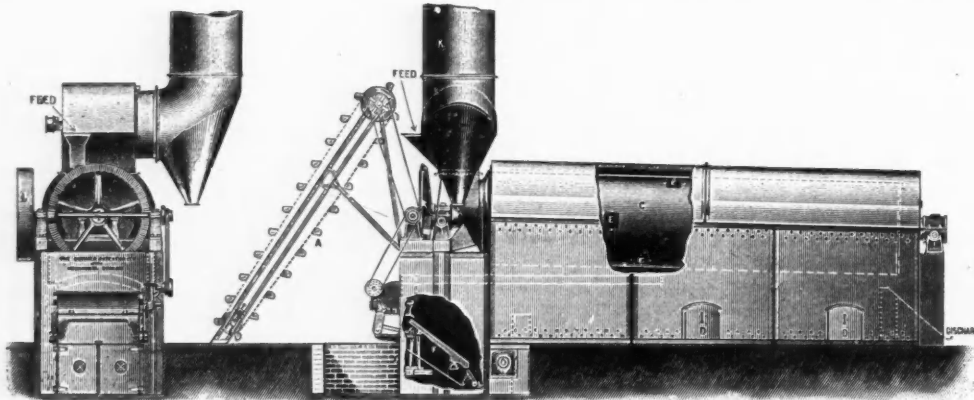
The accompanying illustration represents the new double drum Corliss hoisting engine, built by the Sullivan Machinery Company, of Chicago, which is now being installed and will soon be in operation at the Savoy and Sibley shafts of the Oliver Iron Min-

are located at the centers of the drums. The drum shafts are 36 feet long by 14 inches in diameter, supported by three bearings. There are two auxiliary rope reels, located inside each main drum, for taking up the slack of the hoisting ropes.

The engines are of the Corliss pattern, 28 by 60 inch girder frame, steam jacketed throughout. When operating the boiler pressure is 125 pounds, which is, however, increased to 150 pounds in case of accident to the condensing apparatus. The maximum hoisting speed is 2,000 feet per minute, controlled by a quick-acting governor in connection with the Corliss valve gear. The engine reverse gear is of the steam actuated spiral type. The brakes and clutches are also operated by steam, and the brake engine, clutch engines and reverse engine are provided with oil-cataract cylinders, the object being to prevent sudden or jerky movements of the various parts.

In addition to the main steam brakes above mentioned, there are two sets of auxiliary brakes, one set being operated by compressed air and the other by a hand wheel on the engineer's platform. A special feature of the brake gear is the automatic pressure valve, which will automatically substitute air for steam or steam for air, in the case of failure of either operating medium. The machine is fully equipped with all modern safety appliances. These include positively actuated stops to prevent overwinding, dial indicators to show the position of the cages in the shafts, and automatically operated throttle valves for shutting off steam near the end of the hoist. There is also a small auxiliary throttle valve for con-

trolling the engines after the main throttle has been automatically closed. This is operated by a step on the engineer's platform. Each Corliss cylinder is provided with two by-pass valves for connecting the two sides of the pistons when lowering. The engineer's platform is raised above the floor, and all hand levers and safety appliances are within easy reach of the operator.



CUMMER DRYER WITH MECHANICAL STOKER.

A hoist of similar type, with but one 12 by 8½-foot drum, is operating on the Pioneer A shaft near by. The Sullivan Machinery Company also manufactures flat rope reel hoists, conical drum hoists, and winding engines and haulage plants for all classes of work. A letter to the company, at 135 Adam street,

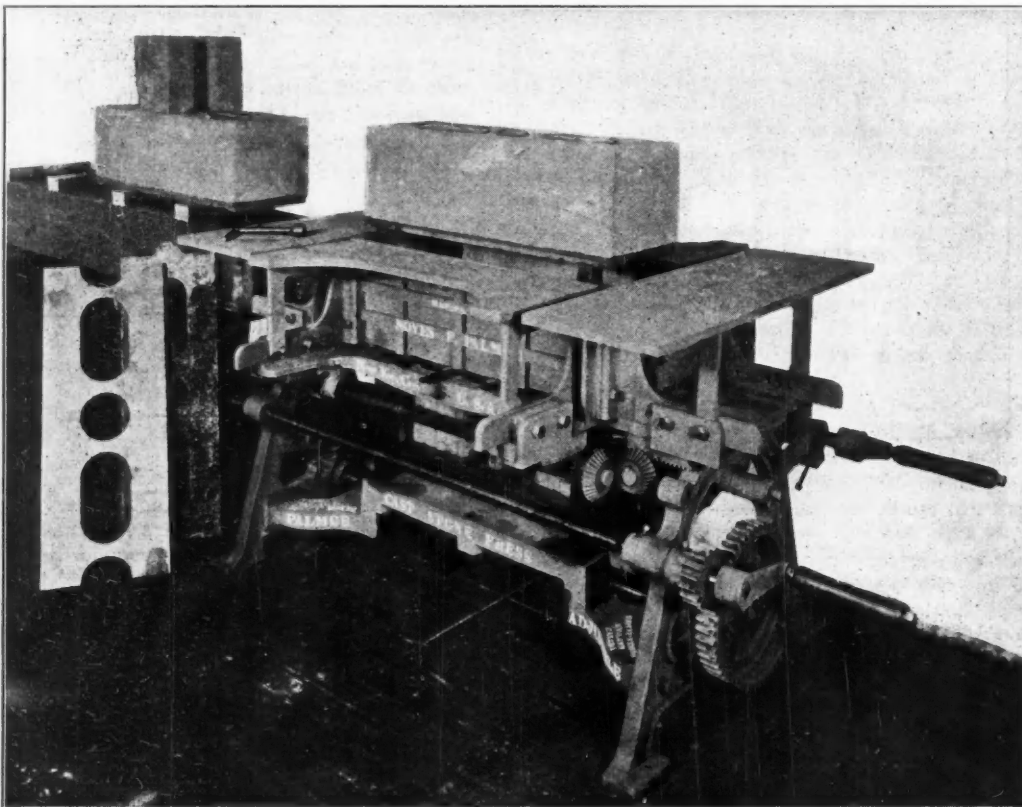
in place of the stoker. The manufacturers say that they are prepared to furnish this dryer in a number of different sizes and at low prices.

PRESS FOR MAKING ARTIFICIAL STONE.

Mr. Noyes F. Palmer, of Brooklyn, New York, has recently put on the market a press of his invention for making artificial stone. The by-products and re-

fuse of mines can be so used by mixing with portland cement and pressed into bricks.

The Palmer adjustable cast stone press, as the machine is called, can be taken to a sand bank, and after mixing the sand with portland cement, the mixture is pressed into building blocks, claimed to



PALMER CAST STONE PRESS.

Chicago; 71 Broadway, New York, or 431 17th street, Denver, Colo., will bring special catalogues and complete information.

THE CUMMER SELF-CONTAINED DRYER.

The F. D. Cumer & Son Company, Cleveland, Ohio, have recently designed and put on the market what they call the Cumer Self-Contained Dryer. As will be seen by glancing at the cut, the dryer cylinder is encased in a steel plate casing, which casing is lined with fire bricks. The makers claim that the dryer can be easily taken down and moved wherever necessary. In this case the Cumer patent mechanical stoker for burning slack bituminous coal is shown in the cut, but any kind of fuel can be used, the company furnishing the proper kind of grate bars

have three times the strength of ordinary building brick.

This press is capable of being set with various face designs for front or facing brick, worth, as estimated by Mr. Noyes, from \$25 to \$30 per thousand. The illustration herewith shows a finished block as it comes from the machine, every block being uniform in size and shape.

The chief points in its construction are adjustable sides, ends and cores which permit a wide range of shapes, all of which shapes may be cast with one movement.

With the Palmer press it is claimed that artificial stone, which compares favorably with Indiana limestone, can be turned out at a cost of 15 cents a cubic foot.

The press weighs 1,800 pounds, and can be handled by three men. Five men can operate two machines, with a corresponding decrease in the cost of operation.

PATENTS RELATING TO MINING AND METALLURGY

UNITED STATES.

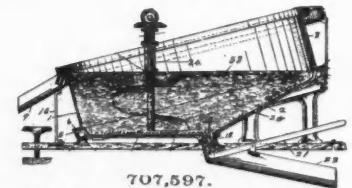
The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon receipt of 25 cents.

Week Ending August 26, 1902.

707,542. MEANS FOR RAISING OR LOWERING MATERIALS.—Herbert A. L. Barry, Westminster, England. An improved winch comprising a shaft, two drums arranged axially but loosely thereon, two carriers, the one fast and the other loose on the said shaft, one or pairs of epicyclic toothed pinions mounted on each carrier, two stationary toothed wheels and a toothed wheel secured to each winding-drum; one wheel of each pair of toothed pinions meshing with one of the stationary toothed wheels and the other wheel of each pair of toothed pinions meshing with one of the toothed wheels respectively secured to the winding-drums.

707,551. METHOD OF ELIMINATING METALS FROM MIXTURES OF METALS.—Guilliam H. Clamer, Philadelphia, Pa. A method of eliminating and replacing part of an alloy, which consists in fusing the alloy and a flux and a chemical metallic compound of which the base is to replace the part to be eliminated and of which the heat of formation is less than that of the part to be eliminated, whereby the chemical compound is reduced and its base enters the alloy and whereby the part to be eliminated enters into the chemical compound and is taken up by the slag.

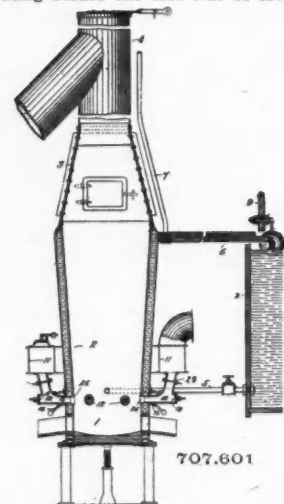
707,584. DRILL-SHAPER.—Dan Greenwalt and James B. Dawson, Breckenridge, Colo. The combination of suitable framework provided with a vertical drill-opening arranged to admit a drill from the top thereof, a bed-plate at the bottom of said opening, a knife arranged at an angle with said opening, and means for actuating said knife.



707,584.

707,597. AMALGAMATOR.—Ernest J. Kiss, Fort Wayne, Ind. A rotary open-topped cylindrical tank; a tilting adjustable support for the said tank; a revoluble spiral agitator mounted in said tank in vertical arrangement and adapted to impart a positive down feed to the contents; means for draining said tank while in operation, and means for actuating said tank.

707,601. SMELTING-FURNACE.—Charles Laughlin, St. Louis, Mo. A smelting-furnace having double walls, and a tube extending through said walls for the tuyere-opening, said tube being beaded one each side of the wall-plates.



707,601

707,602. SMELTING-FURNACE.—Charles Laughlin, St. Louis, Mo. The combination with a smelting-furnace having hollow walls constituting a water-jacket, of a water-tank on a level therewith, a pipe connecting the lower portion of said water-tank with the lower portion of said water-jacket, and a pipe connecting the upper portion of said water-jacket with the upper portion of said water-tank.

707,611. SAND-SCREEN FOR WELL-TUBES.—Cleophas Monjeau, Middletown, Ohio. A tube-point sand-screen for tube-wells, consisting of a perforated cylindrical core having spirally wound thereon a hollow strip of any suitable cross-section, leaving a substantially continuous spiral open-

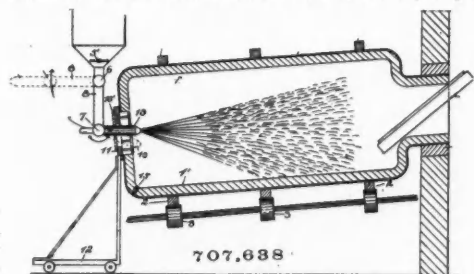
ing between contiguous edges, said strip being provided with external channels communicating with said spiral opening, and a binding element extending through the spiral opening and holding the coil.

707,613. ENDLESS CONVEYOR.—William L. McCabe, Seattle, Wash.—An endless conveyor, comprising a suitable framework, a single cable carried thereby, pulleys at either end of said framework, the cable being wound a number of times about said pulleys and forming a continuous carrier-belt, a similar cable forming a belt and interlacing with said first-mentioned cable on one of its pulleys.

707,626. ELECTRIC MINE-EXPLODER.—Wilhelm Norres, Schalke, Germany. In an electric mine-exploder the combination with a conical firing-stopper containing the fuse composition, of a metal pipe fixed within the stopper, conducting-wires inserted into the metal pipes, and an explosive-shell having a split open edge by means of which the said shell is simply set upon the conical firing-stopper.

707,633. ART OR PROCESS OF LIQUEFYING AIR OR OTHER GASES AND COOLING BY MEANS THEREOF.—James F. Place, Glenridge, N. J. The art or process of cooling by liquid air or other liquid gas which consists in delivering to the space to be cooled a supply of dry cold gas evaporating from an initial charge of liquid air or other liquid gas, and allowing said evaporated gas to subsequently escape from the said space to be cooled, and subjecting compressed air or other compressed gas to the cooling action of said dry cold evaporated gas in successive counter-currents—the first carrying the dry evaporated liquid air or other gas after it has been delivered to the space to be cooled and before or during the time it is allowed to escape therefrom; and the second carrying said dry cold evaporated liquid air or other gas before its delivery to the space to be cooled; and then conducting during the process said cooled compressed air or other compressed gas to and subjecting the same to the cooling action of said initial charge or a replenishing charge of liquid air or other liquid gas, and successively liquefying said cooled compressed air or other gas and delivering same to said liquid charge and evaporating the same; thus continuously replenishing said liquid charge and continuously supplying dry cold evaporated liquid air or other evaporated gas to the counter-currents and the space to be cooled.

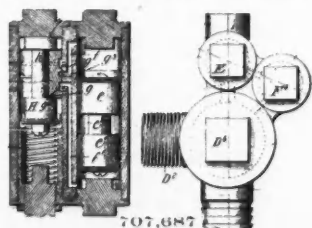
707,638. PROCESS OF PRODUCING STEEL DIRECT FROM OXIDE OF IRON ORE.—Dexter Reynolds, Albany, N. Y.—A process of treating oxide of iron ores to produce therefrom wrought iron or steel, which consists, first, in mixing granulated ore with sufficient granulated carbonaceous material to deoxidize the ore and then duly carbonize the iron in it and introducing and distributing this mixture in a suitable closed furnace; second, subject-



ing this mixture in said closed furnace to the surface action of a neutral heating-flame until the oxide of iron is deoxidized and the iron duly carbonized; third, introducing and distributing into said furnace granulated fluxes suitable in character and amount to remove impurities; fourth, subjecting the resultant mass to the forcible direct impact of a blast-flame directed down and upon the same until the metal is fused, and fifth, separating the slag therefrom, all in one and the same furnace.

707,686. COKE-DRAWER.—David Ferguson, Pittsburg, Pa., assignor of one-half to Oliver G. Ferguson. In a coke-drawer, a frame, a drum mounted therein, a reach-rod, a flexible device operatively connecting the drum and the rod, a conveyor, disconnecting driving connections between the conveyor and the drum, and means secured to the rod to which power may be applied for driving the rod and the drum when the rod is entering the coke-oven.

707,687. AUTOMATIC GOVERNOR FOR FLUID-COMPRESSORS.—Joseph P. Fillingham, Battle Creek, Mich., assignor of nine-tenths to Richard R. Hicks and Eugene L.



Markey, Battle Creek, Mich. The combination of the pump-chamber, the relief-port communicating therewith, and with the atmosphere, a relief-valve chamber into which said port opens, and a relief-valve in said chamber, adapted to close said relief-port in one position and open same in another position; with a governor-valve chamber, a passage for admitting air which has been compressed by the pump into

one end of said governor-valve chamber, a governor-valve operated one way by air-pressure, a spring for forcing said governor-valve in the other direction, adjoining pairs of ports leading respectively from the governor-valve chamber to the atmosphere, and to opposite ends of the relief-valve chamber, said governor-valve being adapted to establish communication through said ports between one end of the relief-valve chamber and the governor-valve chamber, and between the other end of the relief-valve chamber and the atmosphere, or vice versa.

707,688. CONVEYING APPARATUS.—John W. Foreman, Healdsburg, Cal. A conveying apparatus including, in combination, a rigid track; standards upon which said track may be supported; a carriage adapted to travel upon said track; a grip comprising pivoted members having arm extensions; a pivoted yoke engaging said extensions and holding the grip members closed; a fall-block engaged by said grip; and a stop in the path of the yoke for actuating the grip to release the fall-block at a pre-determined point along the track.

707,722. FUEL COMPOUND.—James H. Ricker, Fort Worth, Tex., assignor of two-thirds to Samuel Percival Greene and John Alfred Torney Evans, Fort Worth, Tex. An artificial fuel consisting of ingredients mixed in about the proportions as follows: crude petroleum, 18 3/4 per cent., rosin, 2 1/2 per cent., sawdust, 12 1/2 per cent., clay, 12 1/2 per cent., liquid glass, 2 1/2 per cent. and lignite or coal-dust, 5 1/4 per cent.

707,776. OSCILLATING ELECTRIC FURNACE.—Paul L. T. Héroult, La Praz, France, assignor to Société Electro Metallurgique Française, Froges, Isère, France. In an oscillatory electric furnace, the combination of an electrode, a support, a collar or loop surrounding said electrode and holding it on said support, copper wedges pressed against said electrode by said collar, and a connection between said wedges and the electric circuit.

707,783. PROCESS OF MANUFACTURING ILLUMINATING-GAS.—Charles W. Isbell, New York, N. Y. In the process of manufacturing illuminating-gas from bituminous coal, the loosening of the residual incandescent coke remaining in the generating-retort after the expulsion of said gas to the extent desired, by the introduction into said retort around the said coke of a sufficient quantity of steam to produce the decomposition or combustion and conversion into gas of that portion of said coke contiguous to the sides of the retort.

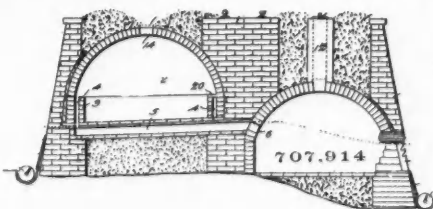
707,788. COMPOSITION OF MATTER.—John Murphy, Columbus, Ohio. A composition of matter consisting of crushed hard iron slag, pulverized high-limed cinders, Portland cement, liquor of flints and water.

707,804. ELECTROLYTIC CELL.—Adolph Sommer, Cambridge, Mass. In an apparatus for the electrolysis of saline solutions; an anode-compartment, a cover therefor, a cathode, an anode in said compartment having a non-conducting horizontal flat upper surface, and a tube for the introduction of material to be electrolyzed, said tube leading through said cover and terminating above said anode.

707,886. PROCESS OF MANUFACTURING MANURE FROM APATITE OR SIMILAR MINERAL PHOSPHATE.—Johan G. Wiborgh and Wilhelm Palmer, Stockholm, Sweden. A process of manufacturing manure from apatite or similar mineral phosphate, consisting in passing an electric current through an electrolytic bath having an anode and cathode and containing an electrolyte consisting of a solution of a salt disengaging at the anode an acid which forms a soluble salt with lime, while at the cathode a basic hydrate is formed, dissolving the mineral phosphate by the acid disengaged and precipitating the same in the alkaline liquid of the cathode as phosphate of calcium, but in another more soluble form.

707,898. ARTIFICIAL STONE.—Feodor Boas, St. Hyacinthe, Canada. A process for manufacturing artificial stone which consists in mixing silicate of magnesia of any degree of sub-division with a small amount of lime and a sufficient quantity of water to impart plasticity to the mixture, then dividing the plastic mixture into parts of any desired shape and size, and submitting the same directly to the action of steam.

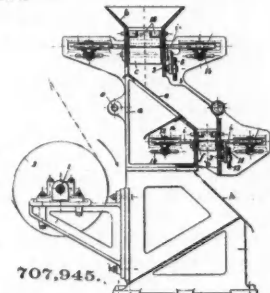
707,914. COKE OVEN.—William T. Gates, Simpson, W. Va. An apparatus for producing different grades of coke comprising a plurality of ovens, and means for conveying



the products of combustion from a point above the floor of an oven producing a lower grade of coke into and beneath the floor of an oven producing a higher grade.

707,926. PROCESS OF EXTRACTING PRECIOUS METALS.—Wilmer Hilt, Coles, Cal., and Clarence E. Lane, Ashland, Ore. A process of extracting precious metals from solutions thereof, which consists in producing zinc-vapor and conducting the same beneath the surface of said solutions, where it immediately replaces said precious metals, thereby precipitating the same.

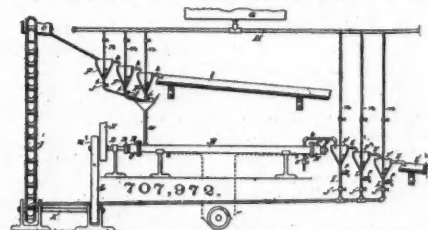
707,945. MACHINE FOR COAL-BREAKING.—Léon de Bertier de Sauvigny, Paris, France. A machine, including a plurality of superposed jaws arranged in pairs, means for actuating said jaws, picks also arranged in pairs and adapted to coact with the respective pairs of jaws, means for actuating the picks and a sieve adapted to receive the crushed material from the upper jaws and serving to separate the fine material from the coarse and to direct the latter toward the lower jaws.



707,960. APPARATUS FOR REFINING OILS.—Edouard Douillet, La Garenne-Colombes, France. A suitable purifying or filtering apparatus, means for heating the same, a serpentine connected to said purifying or filtering apparatus, a suitable source of steam-supply, means connected thereto for subjecting the mass under treatment to the action of the steam, an alembic, and means connected thereto for subjecting the mass under treatment to alcoholic vapors.

707,971. METHOD OF AMALGAMATING METALS.—Paul A. Knappe, Grantville, Ga., assignor, by mesne assignments, to American Amalgamating Company, a corporation of Georgia. A method of amalgamating metals which consists in causing pulp to traverse an amalgamating-space containing mercury, forcibly intermingling the mercury and the pulp during its passage therethrough, removing the gangue from said space, separating the heavier particles from said gangue, and causing them to retrace the amalgamating-space.

707,972. AMALGAMATOR.—Paul A. Knappe, Grantville, Ga., assignor, by mesne assignments, to American Amalgamating Company, a corporation of Georgia. The combina-



tion with an amalgamator, having means therein for forcibly intermingling the pulp and mercury, a pulp-inlet and an outlet for the gangue, of a concentrator for extracting the heavier particles from the gangue, and conveying means to conduct said heavier particles again into the amalgamator near the initial end thereof.

GREAT BRITAIN.

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

Week Ending August 14, 1902.

- 14,749 of 1901. BALL MILL.—P. T. Lindhard, New York, U. S. A. In cylindrical ball mills for grinding wet, special arrangements for regulating the inlet and outlet.
- 15,136 of 190. FREEING COAL MINES FROM GAS.—B. Souheur, Seraing, Belgium. Method of drawing off explosive gases from coal seams, by drilling holes and exhausting, and afterward utilizing the gases so collected.
- 16,985 of 1901. MIN CAR OILER.—J. Mitchell, Barnsley. An automatic oiler for the axles of pit wagons.
- 18,843 of 1901. REMOVING TIN FROM SCRAP.—T. Twynam, Leeds. Stripping tin from scrap by immersing in an emulsion of brine and coke dust, so making oxide, which is easily removable.
- 9,501 of 1902. TREATING GOLD ORES.—F. W. Martino, Leeds. Roasting refractory gold ores with barium sulphide-carbide, soluble sulphides of the base metals being formed, which can be removed by leaching.
- 9,536 of 1902. MAKING SULPHUROUS ACID.—C. Daub, Antwerp, Belgium, and J. C. Ueuther, Detroit, Michigan, U. S. A. A method of regulating the heat of the reaction in making sulphurous acid by the contact process.
- 9,875 of 1902. HYDROCHLORIC ACID MAKING.—General Chemical Company, New York, U. S. A. Making hydrochloric acid by heating sodium pyrosulphate Na₂S₂O₇ with salt and steam, making sulphate of soda.
- 10,492 of 1902. DISCHARGE FOR ORE-BINS.—F. R. Hoover and A. G. Mason, Chicago, U. S. A. A discharge for ore from bins, the ore resting on a horizontal roller and the metal sideways.
- 10,929 of 1902. SMELTING FURNACE.—W. F. Hannes, Denny, New Mexico, U. S. A. A smelting furnace with several air inlets to feed oxygen to various parts of the charge.

PERSONAL.

Senator Thomas Kearns has returned to Utah from his trip to Europe.

Mr. F. H. Minard has returned to Denver, Colo., from South Dakota.

Mr. Philip Mixsell, of Denver, has been visiting mining property in Gilpin County, Colo.

Mr. G. E. Newcomb, of Chicago, Ill. is looking after mining interests in Gilpin County, Colo.

Mr. Bradford H. Locke is in Denver, Colo., making arrangements to introduce a new electric drill.

Mr. Richard Eames, Jr., has returned from Arizona and Mexico and is now in New York City.

Mr. Ross E. Browne is visiting Mr. Louis Janin at his ranch in Santa Barbara County, California.

Mr. Thos. Ovens manager of the Hap Hazzard Mining Company, at Leadville, Colo., is east on a business trip.

Mr. A. E. Bruce has resigned his position as chief clerk of the Shannon Copper Company, at Clifton, Ariz.

Mr. Charles Watson has returned to Salt Lake, Utah, from a several months' prospecting trip into Alaska.

Mr. Frank C. Smith, of the Engineering Company of America, is in New Mexico, examining copper properties.

Mr. Leo Von Rosenberg arrived in New York City from the West last week and left for Mexico on September 8.

Mr. George W. Schneider, a surveyor of Central City, Colo., has returned after a trip to Utah and Yellowstone Park.

Mr. M. H. Walker, president of the Alice Gold and Silver Mining Company, who has been on the Pacific coast, is in Butte, Mont.

Mr. Len Humphreys, of Central City, Colo., has gone to Utah to look at a mine and smelter proposition for Eastern parties.

Mr. A. Stansfield, professor of metallurgy at McGill University, Montreal, Quebec, has returned there from a trip to Nelson, B. C.

Mr. E. H. Wolcott, of Wolcott, Ind., has been in Leadville, Colo., for a few days looking after mining interests in the Leadville Basin.

Mr. Ernest Levy, accompanied by Mr. L. Humphreys, has left Denver, Colo., to examine certain properties near Mackay, Idaho.

Mr. John Dern, president of the Consolidated Mercury Company, has returned to Salt Lake, Utah, from a month's trip to the Pacific coast.

Mr. Alvin Phillips, metallurgical engineer, of Denver, Colo., has returned from a professional trip in the interest of an Eastern syndicate.

Mr. C. H. Palmer, formerly manager of the Butte & Boston Company at Butte, Mont., is examining mining properties near Sheridan, Mont.

Mr. Oscar Szontagh is no longer manager of the Northport Smelter at Northport, Wash. Mr. A. W. Watson, who has been foreman, is now superintendent.

Mr. George W. Hull, manager of the Sullivan group in East Kootenay District, B. C., has been in Spokane, Wash., to attend a meeting of the Sullivan Company.

Mr. T. A. Rickard, accompanied by Messrs. H. N. Tod, Lionel Lindsay and C. H. Wittenoom, has started on a long horseback trip through Central Colorado.

Mr. Duncan McDonald, of Virginia, Nev., has gone to San Salvador to take charge of the underground workings of a mine owned by the Charles Butters Company.

Mr. J. J. Brown, one of the owners of the Ibox Mine, at Leadville, Colo., has just returned to Leadville after an absence of some months visiting foreign points.

Mr. G. D. B. Turner, formerly manager of the Revenue Mine, Madison County, Mont., is now managing the property of the J. I. C. Company, Park City, Utah.

Mr. William McCune has been made superintendent of Birmingham, Ala., furnaces for the Sloss-Sheffield Steel and Iron Company, with Mr. J. J. Shannon as consulting furnace manager.

Mr. John B. Hastings has been in Denver, Colo., during the past week. Among others who have passed through Denver recently are Mr. Ben B. Lawrence and Mr. Percy L. Fearn.

Mr. H. F. E. Gaum, of Rutherford, N. J., has just returned from a trip to Western Ontario with a party of New York City men, who have been looking over some mineral lands there.

Mr. Fred Bradshaw is in Mexico making investigations for the Engineering Company of America regarding the installation of a plant to treat an ore containing copper, silver and gold.

Mr. B. W. Goodsell, who attended the Butte Mining Congress, is visiting several mining camps in Montana and Utah, looking after the various properties in which he is interested.

Messrs. William G. Mather and James Russell, of Cleveland, O., have been visiting the mines of the Cleveland-Cliffs Iron Company, in Michigan. Mr. Mather is president of the company.

Mr. W. J. Cox, superintendent of the Mollie Gibson and Argentum Juniata properties at Aspen, Colo., has resigned, and goes as superintendent and manager of the Camp Bird Mine at Ouray, Colo.

Dr. Cady Staley, who has retired from the presidency of the Case School of Applied Science, at Cleveland, O., after 16 years of service, has gone abroad, where he expects to remain for several years.

Mr. Carl Henrich, of the firm of Wiley, Mitchell & Company, of New York, has spent a week in Leadville, Colo., making a final examination in the interest of the proposed electrical power and railway plant.

Dr. F. M. Simonds and Mr. E. Z. Burns, of the firm of Simonds & Wainwright, New York City, have left for an extensive examination of mining property in California. They expect to be gone about two months.

Mr. F. F. Sharpless, mining engineer, has left New York City for Honduras, Central America, to be gone all winter on business for the Consolidated Mines Selection Company, which already has interests in Salvador.

Mr. C. M. Eye has resigned as superintendent of the Alpine Mine, at Georgetown, Colo., to take a position with the War Eagle Consolidated Mining and Development Company as smelter representative at Trail, B. C.

Mr. John F. Campion, one of the heaviest owners and general manager of the Ibox Mining Company, at Leadville, Colo., who has been spending the past three months at the seashore near New York City, returned to Colorado last week.

Mr. Charles S. Thorne succeeds W. B. Campbell as president of the Pocahontas Collieries Company, which owns and operates the coal mines at Pocahontas, W. Va. The head office will be in Philadelphia. The new owners are mostly New York City men.

Mr. Thomas B. DeArmit, who some time ago resigned as general superintendent of the Empire Coal Mining Company, of Bellaire, O., has been made general superintendent of the Sharon Steel Company's mines. Mr. DeArmit will make his headquarters at Grove City.

Capt. Harry Johns, superintendent of the Montreal & Boston Copper Company's Sunset Mines, Greenwood, B. C., has returned to the mines, after a trip to Montreal to confer with the directors of the company.

Mr. George W. Fraser is now master mechanic at the British Columbia Copper Company's Mother Lode Mine, near Greenwood, B. C. He was similarly employed some time since at the Granby Company's mines, in the Boundary District, but during the past year has been engaged in mechanical work in the United States.

Mr. J. Stanley James, engineer of the Caucasus Mining Company, of South Russia, who has been in the United States for several weeks, has placed contracts for a 500-h.p. hydraulic plant, which will be utilized for operating the company's mines. The General Electric Company will furnish the generators and the Pelton Water Wheel Company, the water wheels.

Mr. Albert I. Goodell, superintendent of the Montreal & Boston Copper Company's smelter at Boundary Falls, near Greenwood, B. C., has returned to Boundary from a meeting of the management of the company in Montreal, Quebec. From Montreal Mr. Goodell went to Boston and New York and thence to Denver. He expects to blow in the furnace at the Boundary Falls smelter shortly.

Mr. Herman Thofern, a well-known metallurgical engineer, has returned to New York City from a 3 years' professional trip to China and Siberia. He has visited the copper mines in Kaya, Manchuria, and erected a smelter there which will operate on the Thofern-St. Seine method. Mr. Thofern will soon leave for China again, to be gone until March next, when he expects to return and make his headquarters in New York City.

Mr. R. W. Brock, of the Canadian Geological Survey, will fill the chair of geology at Queen's University, Ontario, during the ensuing winter term, succeeding Prof. Miller, who has been appointed Provincial Geologist for Ontario. Mr. Brock is at present in the Boundary District completing a topographical and geological examination of the district. He will not sever his official connection with the Dominion Geological Survey, but will obtain leave of absence for the winter.

Mr. W. Work Slater, of Edinburgh, Scotland, a director of the Jewel Gold Mines, Limited, of Long Lake, Boundary District, B. C., recently visited the mine which during the current year has shipped, chief-

ly to the Granby Company's smelter, about 2,200 tons of gold quartz ore, for lining the copper converter shells. This ore is stated to carry an average value of about .55 oz. to the ton. Mr. Slater is also managing director of the Scottish Colonial Goldfields, Limited, of Edinburgh, which owns the Alamo and Idaho silver-lead mines in the Slocan District.

Dr. A. Stansfield, of England, who is professor of metallurgy at McGill University, Montreal, Quebec, recently visited British Columbia. For two months he has been traveling and has visited Boston, New York, Philadelphia and other large cities, and the smelting centres of Utah, Colorado and Montana. At Victoria, B. C., he met Mr. Wm. Fleet Robertson, Provincial Mineralogist, and Mr. Herbert Carmichael, Provincial Assayer, the latter having just returned from visiting the copper smelters now nearing completion on Vancouver Island. The Granby Company's smelter, at Grand Forks, and that of the British Columbia Copper Company, at Greenwood, were visited by Dr. Stansfield, who went thence to see the Hall Mines works at Nelson before returning East via the Crow's Nest Pass and Sudbury, Ont.

OBITUARY.

John H. Taylor, a wealthy mining man, of Joplin, Mo., died in Kansas City, Mo., on August 30, aged 65 years. He was born in England, but came to this country at an early age, and lived for many years at Independence, Mo. About 15 years ago he went to Joplin, where he afterwards lived. He invested heavily in lead and zinc lands about Joplin, which he leased to miners. He left a wife, 2 sons and a daughter.

SOCIETIES AND TECHNICAL SCHOOLS.

SOUTH DAKOTA SCHOOL OF MINES.—The fall term at this school at Rapid City will open September 17. Robert L. Slagle continues as president; C. H. Fulton as professor of mining engineering and metallurgy, and C. C. O'Hara as instructor in mineralogy and geology, H. L. McLaurie is professor of mathematics; Mark Ehle professor of engineering; C. L. Lewis lecturer on mining law; A. D. Humbert instructor in the commercial department, and E. M. Stevens librarian and instructor in languages. The new building, completed last winter, will be in use this year, giving the school an abundance of room.

MICHIGAN COLLEGE OF MINES.—The graduating exercises at this school at Houghton, Mich., were held on August 29. At the exercises in the afternoon the new chemical building and the new mining engineering building were formally dedicated. Dr. Edward Orton, Jr., dean of the College of Engineering of the Ohio State University, and Dr. Calvin M. Woodward, dean of the School of Engineering of Washington University, St. Louis, Mo., spoke at the dedications. In the evening Chase S. Osborn, Commissioner of Railroads for the State of Michigan, delivered the address at the graduating exercises.

There were 25 young men in the graduating class, of whom 8 took the degree of Bachelor of Science and 9 that of Mining Engineer, while 8 took both degrees.

INDUSTRIAL NOTES.

The Ogden Assay Company, of Denver, Colo., has moved to larger and more conveniently situated quarters, and is at present located at 1725 Arapahoe street.

The Burt Manufacturing Company, of Akron, O., reports orders from the United States Government for 2 Cross oil filters for use on one of the new torpedo boats, and also 2 filters for the navy yard at Bremerton, Wash.

The Pennsylvania Salt Manufacturing Company, of Wyandotte, Mich., has recently purchased a number of direct-current motors from the Westinghouse Electric and Manufacturing Company, for installation in its plant at Wyandotte.

At a special stockholders' meeting of the Cuban Steel Ore Company recently held in Camden, N. J., a report of the president was presented calling attention to the exhaustion of the mines and the imminent winding up of the company's affairs.

At the annual meeting of the Welsbach Company held at Gloucester, Pa., September 10, the present Board of Directors was re-elected. The annual report for the fiscal year ending May 31 shows a surplus after deducting fixed charges, sinking fund and dividend, at \$96,877, a decrease of \$23,004.

The United States Steel Company, Canton, O., has placed an order for 4 250-h.p. water-tube boilers with the Pittsburg Gage and Supply Company, Pittsburg. Other recent contracts include power transmitting machinery outfit for the Maryland Paper Company and a rope transmission for the State Institution for the Feeble Minded, at Polk, Pa.

At the annual meeting of the stockholders of the

Thomas Iron Company at Hokendauqua, Pa., on August 9, the old directors were re-elected as follows: Samuel Thomas, William H. Hulick, F. R. Drake, J. S. Rodenbough, J. S. Krause, W. P. Hardenbergh and B. F. Fackenthal, Jr. These elected the following officers: B. F. Fackenthal, Jr., president; William H. Hulick, vice-president; James A. Weaver, secretary and treasurer. The reports of the officers showed a satisfactory year's business.

The Jeanesville Iron Works Company, through its Denver branch, has sold the El Paso Consolidated Gold Mining Company, of Cripple Creek, Colo., a triple expansion pump, capacity 21,000 gals. against 750 ft. lift, fitted with Corliss steam valves. This will be the largest pump in the Cripple Creek District. The Jeanesville Company is also building a compound condensing pump, capacity 1,000 gals. per minute, against 1,000 ft. lift, for the Golden Cycle Mining Company, of Cripple Creek.

The Raritan Structural Steel Company has awarded contracts for erecting a plant at New Brunswick, N. J., on 12 acres of land recently purchased. The plant is to be equipped for assembling and manufacturing general bridge and structural steel and iron work, and the company is now in the market for the equipment of tools, etc. Winfield S. Thorp, secretary and general manager, 38 Park Row, New York City, is attending to the purchasing. The other officers are: Charles F. Terney, president and chief engineer; John Gerkin, vice-president; Julian M. Pinkney, treasurer.

The Pittsburg Plate Glass Company has contracted with the Wm. B. Scaife & Sons Company, of Pittsburg, Pa., for a 2,500-h. p. We-Fu-Go water softening and purifying system, to be erected at the Elwood, Ind., plant. Among some of the recent contracts closed by the Wm. B. Scaife & Sons Company for both the Scaife and We-Fu-Go water softening and purifying systems are the following: Union Steel Company, Donora, Pa., 500,000 gal.; Pennsylvania Salt Manufacturing Company, Wyandotte, Mich., 150,000 gal.; Ogemaw Company, North Bay City, Mich., 1,500-h. p. plant; Ogemaw Company, West Branch, Mich., 500-h. p. plant; Lancaster Manufacturing Company, Clinton, Mass., 1,000,000 gal.; Gibson Manufacturing Company, Concord, N. C., 100,000 gal.

The stockholders of the Federation Window Glass Company have organized a selling company, which will handle the output of its factories. The company now controls 760 pots, with an annual output of 2,000,000 boxes of glass. The headquarters of the selling agency will be in Columbus, O. The following officers have been elected: President, J. R. Johnson, Hartford City, Ind.; vice-president, T. C. Wheaton, Millville, N. J.; secretary, Leopold Mambourg, Muncie, Ind.; treasurer, William L. Munro, Pittsburg; Executive Committee: J. R. Wick, Danville, Ill.; W. R. Jones, Morgantown, W. Va.; M. L. Case, Bowling Green, Ohio; Charles Dike, Hartford City, Ind.; J. M. Allen, Gas City, Ind.; Octave Jacquain, Mathews, Ind.; George Jones, Bridgetown, N. J.; E. H. Flood, Atco, N. J.; T. L. Eyre, Westchester, Pa.; J. R. Smalley, Sandusky, Ohio; J. L. Knisley, Bellefonte, Pa.; W. W. Miller, Wellsboro, Pa.; A. B. Ledwith, Brownville, Va. A committee was appointed to fix a wage scale, and the time for starting and closing the factories controlled.

The Chicago Pneumatic Tool Company reports that its air compressor plant at Franklin, Pa., is operating day and night. Among recent sales of importance are 2 large compound compressors for the New York Central & Hudson River Railroad Company's Jersey Shore shops; 2 large compressors for the Readville shops of the New York, New Haven & Hartford Railroad Company; a compound compressor of 2,000 cu. ft. capacity per minute for the Lake Shore & Michigan Southern's Collinwood shops, being a duplicate of the first compressor installed; a 1,000-ft. compound compressor for the St. Louis, Iron Mountain & Southern Railroad, and one of the same capacity for the new shops of the Cleveland, Cincinnati, Chicago & St. Louis Railway. The Chicago Pneumatic Tool Company has also secured the Government's order for the installation of a 1,000-ft. compound compressor at the Norfolk Navy Yard. Other sales include 5 large size straight line compressors to the American Lime & Stone Company, Tyrone, Pa.; a 1,000-ft. compound compressor to the Mobile & Ohio Railroad for the shops at Mobile, Ala., and a 500 cu. ft. capacity compressor to the Louisville & Nashville Railroad.

The American Agricultural Chemical Company, known as the Northern fertilizer combination, has issued its report for the year ended June 30, 1902. This shows total assets of \$42,470,055. The aggregate income this year was only \$1,605,705, from which \$462,580 has been deducted for contingencies and improvements in property, leaving profits of \$1,142,725. Of these profits \$1,028,754 has been paid in dividends on the outstanding preferred stock, leaving a balance of \$113,971 to which is added \$915,071 as the amount carried forward from the previous year, making a total surplus on June 30, 1902, of \$1,029,042. Since its

organization the company has purchased desirable going concerns which were not included in the prospectus, and has also purchased, under an existing option, a valuable factory property in Baltimore, formerly leased, the aggregate of cash considerations for these properties being about \$817,000. The company has also secured for cash all but 47 shares of the 12,500 shares capital of the Peace River Phosphate Mining Company, which owns and operates one of the most valuable phosphate properties in Florida. In addition to the amount charged off yearly for improvements, betterments, renewals, etc., the company has expended for new buildings, machinery, equipments and certain real estate additions to factory properties at various locations, \$485,565 in cash. It was considered advisable to invest in certain schooner properties which, together with the foregoing purchases, made a total of about \$2,200,000, all of which was paid out of working capital, rather than increase, at the time, the amount of outstanding capital stock. The business for the year, as indicated in tonnage, shows a satisfactory increase. Notwithstanding the fact that the prices of raw materials—and especially of ammoniates—were higher, the company has not increased the price to the consumer.

TRADE CATALOGUES.

The American Blower Company, manufacturer of A. B. C. heating and ventilating apparatus, dry kilns, fans, blowers, engines, etc., of Detroit, Mich., has issued an artistic little pamphlet, entitled "At Home," which calls attention to the company's manufacturing facilities and the equipment of its present works.

Industrial railways for shop transportation are described in circular No. 0216, issued by C. W. Hunt Company, of West New Brighton, Staten Island, N. Y. In the Hunt system of industrial railways, storage battery locomotives are used as motive power, and a gauge of 21½ in. for the tracks. The system allows cars to round curves of 12 ft. radius, thus reaching readily every part of an industrial plant.

The Scully Iron and Steel Company, of Chicago, Ill., issues an illustrated stock list of 144 pages, which contains, in addition to long lists of supplies, various tables of interest to the mechanical engineer. The company deals in steel and iron sheets and tubes, structural forms, tool-steel, wire rope, rivets, bolts, sheet-steel roofing, perforated metals, pneumatic tools, etc.

The Lunkenheimer Company, of Cincinnati, O., has issued a revised edition of its illustrated catalogue and price list of brass and iron valves, injectors, lubricators, oil and grease cups, whistles and steam specialties. The pamphlet contains 208 pages, is well printed and bound and in every way worthy of the high standard of the wares it describes. It contains a good index and some useful tables. It will be sent free upon application to the company.

Ideal steam engines are fully described in a superb 78-page pamphlet, published by A. L. Ide & Sons, of Springfield, Ill. These engines embody the self-oiling system, patented by A. L. Ide, and the other features that have been worked out in the 15 years that the engines have been on the market. The valve mechanism is simple, light and easily driven, and the engines are regularly equipped with a plain or an adjustable piston valve, while special engines with flat-balanced valves are also built. The engines may be had either simple or tandem compound, and are particularly recommended for electric light work.

B. Saunders Sons, of Yonkers, N. Y., issue a cloth-bound pamphlet of 126 pages describing pipe-fitters' tools for wrought iron and steel pipe. All the tools shown in the catalogue, with few exceptions, are of the company's manufacture, and are carefully examined and thoroughly tested before offered for sale. The list includes chucks, dies, die stocks, pipe-threading machines, tapping and drilling machines, vices, tongs, wrenches, etc. The pipe-cutting and threading machines for hand or light power are of various sizes, cutting pipe from ½ in. to 2 in. or larger. The catalogue also describes larger machines, to be driven by a directly-connected electric motor. These machines are capable of threading pipe from 2 to 8 in. in diameter.

Klein's combination classifier is described in an 8-page pamphlet published by the Allis-Chalmers Company, of Chicago, Ill. This classifier is stated to embody a new principle—the use of compressed air with the water to affect sizing—thus greatly reducing the quantity of water usually required. The company claims that the classifier can be used to size or separate materials crushed as coarse as 6 mm., and to size anything finer, even to the most minute particles; also that the classifier dispenses with the use of the many sizing trommels formerly required in a concentrating plant. The classifier is in use at the plant of the Desloge Consolidated Lead Company, Desloge, Mo., and also at the plants of the Granite Bimetallic Consolidated Mining Company, Phillipsburg, Mont., and the Butte & Boston Company, at Butte, Mont. It is made in 3 sizes, the capacity of

the coarse classifier being about 75 tons per 24-hour day and of the fine classifiers about 50 tons.

A booklet of attractive appearance, entitled "No Scale Shall Form in Boilers," is issued by the Harrison Safety Boiler Works, of Philadelphia, Pa. It describes the Corge-Cochrane system for heating and purifying feed water for boilers. In this system all the exhaust steam condensed in heating the entire feed supply is conserved, and only a minimum quantity of raw water is required or chemically treated. All scale-forming ingredients in the raw water are treated in a feed-water heater with suitable chemical reagents, insuring precipitation. Another pamphlet issued by the Harrison Safety Boiler Works, entitled "Economy for Collieries," describes the Cochrane feed-water heater. While coal is cheap at collieries, the boiler feed water is generally bad, and needs purification. In the Cochrane heater the steam and water come into direct contact, and all the steam condensed, amounting to about 1-7 of the total water required by the boilers, is saved. Cast-iron, copper and brass are used in the parts subject to heat and water, and the heaters are recommended for their durability and ease of cleaning.

GENERAL MINING NEWS.

Chesapeake & Ohio Railway Company.—The shipments of coal and coke in the fiscal year ending June 30 are officially reported as below, in short tons of 2,000 lbs.:

	1901.	1902.	Changes.
Coal:			
New River	3,644,195	3,999,675	I. 355,480
Kanawha	1,235,506	1,239,750	I. 4,244
Kentucky	82,311	134,354	I. 52,043
From connections	4,912,012	5,433,785	I. 471,773
Total	65,937	63,728	D. 2,209
Coke:			
New River	5,027,949	5,497,513	I. 469,564
Kanawha	312,641	372,377	I. 59,736
Kentucky	65,058	99,570	I. 34,512
From connections	377,699	471,947	I. 94,248
Total	15,274	3,207	D. 12,067
Total coal and coke	392,973	475,154	I. 82,181

The increase in coal is credited chiefly to Eastern consumption, while the coke went principally to the West.

Pennsylvania Railroad Company.—The shipment of coal and coke originating on this company's lines East of Pittsburg and Erie from January 1 to September 6, are officially reported as follows, in short tons:

	1901.	1902.	Changes.
Anthracite	3,181,593	1,617,067	D. 1,564,526
Bituminous	13,448,543	17,028,077	I. 4,179,534
Coke	5,570,304	6,656,492	I. 1,086,188
Total	22,200,440	25,901,636	I. 3,701,196

The total increase this year is equal to nearly 17 per cent, chiefly in bituminous coal. The anthracite shipments have fallen off 49 per cent owing to the miners' strike.

ARIZONA.

COCHISE COUNTY.

Tombstone Consolidated Mines Company.—The company has about completed its big hoisting and pumping plant on Contention Hill, south of Tombstone. The large steel gallow's frame, with its sheaves for the flat cables, is in place. The 4 500-h.p. boilers are ready for firing. Steam pipes are being connected up with the Corliss hoisting engines. Two large centrifugal pumps are ready to be lowered into the mine as soon as the stations are cut. Work is fast progressing on the lower levels of the mine, opening up the old drifts and making air connections, etc.

MOHAVE COUNTY.

(From Our Special Correspondent.)

C. O. D. Mines Company.—This company at Stockton Hill, is working a large force and taking out good ore.

Leland-Mitchell.—Col. Thomas Ewing is closing up a deal on these mines at Boundary Cone. Fred M. Miller, of Grass Valley, Cal., has been making an examination for a San Francisco, Cal., syndicate.

Lucky Boy.—The shaft in this mine in the Cerbat Range is down over 500 ft. Fred Stull is superintendent.

Minnesota.—Superintendent E. T. Loy, of this mine at Chloride, has let a contract to Billy Williams and Billy Campbell to drift 200 ft. from the 400-ft. level. Other workings are producing good silver ore.

Ramrod.—Ben Hastings, superintendent of this mine at Virginia Camp in Weaver District, has 15 men busy. A milling plant is under consideration.

San Francisco.—This mine in Cedar District, has passed into the hands of the Yucca Cyanide Mining and Milling Company.

Senator.—This mine at Grass Springs is having its old free milling plant remodelled. The mine is owned by C. E. Lindberg and M. Goldberg of Minnesota.

Tennessee.—Superintendent H. N. Botsford, of this mine at Chloride, has laid off 25 men until more ground is open.

Val Verde Company.—This company, of Jerome, has closed a deal with James Uncapher, of Mineral Park, for several mining properties and will soon begin work.

Vulcan Smelter.—The machinery for a lead stock at this plant at Chloride will arrive in a few days.

Woodchopper.—Charles Hunsaker and Fred M. Miller have been making an examination of this property at Mineral Park for a St. Louis, Mo., company. The mine belongs to Capt. Ike Conkery, of Mineral Park.

ARKANSAS.

MARION COUNTY.

(From Our Special Correspondent.)

W. H. Wingate, of Seattle, Wash., has purchased 200 acres of land on White River, north of Dodd City, and intends to put in several drills and start prospecting work.

Almy.—This mine, near Harrison, is said to show zinc sulphide free from silicates. The property is piling up concentrates while awaiting the arrival of a number of traction engines with which it will haul its ores to the railroad at Harrison.

NEWTON COUNTY.

(From Our Special Correspondent.)

Spear.—A deal has been closed, transferring this tract of 200 acres on Davis Creek to T. D. Murdock, of Galesburg, Ill. This property is now being leased for 10 years to the Spears Mining Company, of which John C. Bunch is superintendent, and is pushing work.

CALIFORNIA.

ALPINE COUNTY.

(From Our Special Correspondent.)

Curtz-Evans Mining Company.—At these mines at Loope, Capt. Peter Curtz, manager, A. C. Kingsbury, assistant superintendent; the new 100-ton mill is nearing completion. The ore will be brought from mine to mill by an aerial tramway.

AMADOR COUNTY.

(From Our Special Correspondent.)

Defender.—At this mine at Defender, F. B. Joyce, superintendent; the new hoist is going up and the new 10-stamp mill will be ready by October. The old plant was destroyed by fire last month.

Dooley.—At this mine, owned by the Dooley Brothers at Mountain Spring about 6 miles from Ione, connection is made between the middle and south shafts and considerable ore has been extracted.

Edinburgh.—John Williams and D. Fisher have contracted to sink the shaft of this mine at Weiland.

Hoffman.—In this mine at Jackson, owned by W. F. Detert, a tunnel is being run to tap the ledge found in the Argonaut, adjoining.

Horn.—At this mine at Defender, the drift along the ledge is being pushed ahead.

Manzanita.—In this mine at Volcano, L. A. McRae, superintendent, the tunnel has been cleaned out and retimbered, and an upraise started.

Newton.—At this mine at Ranlett, Col. H. D. Ranlett is leaching the old copper dumps.

Nugget.—John Robertson and Mr. Davis of this mine, between Ione and Mountain Springs House, have been bonding and buying other claims nearby.

Particenne Brothers.—It is reported that the Particenne Bros., of Middle Creek, intend putting in a complete plant at their granite quarry including steam cranes, channelers, saws, polishers, etc.

South Eureka.—John Truscott is superintendent of this mine at Sutter Creek, J. F. Parks having resigned, as his duties at the Kennedy take his entire time.

BUTTE COUNTY.

(From Our Special Correspondent.)

North California Gold Mining Company.—This new company has the following directors: G. D. W. Vroom and Scott Scammel, of Trenton, N. J.; Jos. Sinn and H. H. Yard, of Philadelphia, Pa., and Samuel L. Gillin, of Belmar, N. J. Mr. Yard, the manager, is at present in Oroville. The company is going into placer mining on a large scale and has taken up about 25,000 acres of mining land in different claims along the North and Middle Forks of the Feather River. A railroad will be built from Oroville up along the North Fork. The properties lie between Big Bend and the De Long mines. A narrow gauge road will be laid along the banks and dredge scoops will be placed on cars for dredging the narrow river. The material lifted will be transported to the lands below where it will be washed. The company has acquired about 15 miles of river bed. Many more claims are being taken up, some in Plumas county.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Duchess.—In this mine, near Vallecito, W. E. Emery, secretary and treasurer, sinking is in progress.

Fannie Marie.—At this mine at Glencoe, F. O. Courtmarsh, manager, and Chas. S. Blake, superintendent, the new gallows frame is completed. In the Blue Jay belonging to the same company, the new electrical machinery has started.

Iowa Consolidated Mining Company.—In this mine at Rich Gulch a strike of very high grade quartz has been made.

Maltman.—This mine at Angels formerly known as the Pioneer and later as the United Labor, is to be worked by a new company the directors of which are Geo. E. Stickle, Warren Rose, James Maltman and Frank Solinsky, of Angels, and D. Cosgrove, of Fresno.

Melones.—In this mine, at Melones, W. C. Ralston, manager, the track in the tunnel has been wired and 4 cars haul the ore to the mill, the 60 stamps of which are again running.

Morning Dew.—In this mine, near Angels, Fred Pareto has found an 8 ft. ledge at 45 ft.

KERN COUNTY.

(From Our Special Correspondent.)

Friday.—This mine, at Havilah, belongs to S. L. Ferguson, who is about to sell to a Los Angeles company with sufficient means to properly develop it. The deepest works are not lower than 125 ft. at present.

Gold Peak Group.—This group, near Bakersfield, has been acquired by W. F. Snyder for the Western Exploration Company.

Homer.—Mr. Sanbery, superintendent of this mine at Havilah, has struck a good seam in the country rock while running a tunnel to the main ledge.

King Solomon.—In this mine at Havilah, John Hayes superintendent, the force of miners has been increased.

Little Butte.—Operations on this mine, at Randsburg, have been resumed under superintendency of P. H. McMahon.

McKinley.—It is stated that work will shortly resume at this mine at Havilah, Duncan Ferguson, superintendent.

Oil Tanks.—The Standard Oil Company has ordered 20 more 35,000-bbl. tanks for the Kern River field. The Southern Pacific Railroad Company is placing 72 of these tanks along its lines at various points.

Oil-Well Drillers' Union.—In this county a union of this name has been formed to make uniform wages. Last year the drillers were getting \$7 to \$8 per day, while now wages are \$4 to \$5 per day.

Standard Mining and Reduction Company.—F. V. Layton has acquired by purchase the interests of C. Kuffel and A. Nixon in this company's holdings, including the Stanford and Gold Coin mines and the Red Dog mill at Randsburg.

MADERA COUNTY.

(From Our Special Correspondent.)

Alpha Consolidated Mining Company.—This mine, at Coarse Gold, J. P. McFarland agent, is to have 2 cyanide plants, in one of which the tailings dump is to be treated.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Buckeye.—Active work will start at once on this mine near Mariposa, owned by D. F. McRea and others.

Martini.—Mr. Bagsby has leased this mine, near Coulterville, and has men at work.

Merced Gold Mining Company.—The 40-stamp mill at Coulterville, F. P. Mills superintendent, has been closed for lack of water and will not start until the rains fill the reservoir. The mill had a continuous run of 8 months.

Pino Blanco.—At this mine at Coulterville Capt. Ward has several men running 2 tunnels.

Turner.—This mine near Mount Bullion is worked by J. F. Hutchinson, H. L. Wilson and L. F. Cruse. A 40-ft. shaft has been sunk and 120-ft. tunnel is to be extended 110 ft. to tap the vein. Development mainly has been done.

NEVADA COUNTY.

(From Our Special Correspondent.)

Frank.—This mine near Blue Tent, is to be worked by a newly formed company with the following directors, residents of Nevada City: R. P. Rosen, C. O. Jepson, Geo. A. Hurst, Alex. Hongell and E. J. Morgan.

Gold Tunnel.—At this mine near Nevada City electric machinery is being installed.

Grass Valley Consolidated Mining Company.—In this mine at Grass Valley, General Manager Root

has the shaft down 700 ft. and is sinking 300 ft. deeper. A new Norwalk compressor has been installed.

Gray Eagle.—This mine at Nevada City is being reopened by W. C. Monroe, who has ordered a 10-stamp mill.

Meadow Lake District.—In this district 10 miles from Cisco. The Crystal Lake Company now has a mill and roaster on the old Excelsior or Hartley Mine, Haughton Murray, superintendent. Thirty miners are employed. None of the mines have as yet been fully developed. Though the district is a very old one the ores are hard to reduce. There are 150 claims in the district, but only one is busy. A 10-mile trail leads to Cisco, but the distance by wagon road to Truckee is 36 miles.

New Independence.—Superintendent Root is arranging for a new 10-stamp mill on this mine at Graniteville.

Pennsylvania Mining Company.—The mill at this mine, Grass Valley, has started after long idleness. The ore coming from the 700-ft. level. No report has yet been made as to the \$600,000 damages against the Grass Valley Exploration Company for taking ore from the Pennsylvania ground.

Pine Hill.—In this mine in the Lime Kiln District 11 men are at work under superintendent J. A. Robles. A new 10-stamp mill is being constructed and 3 concentrators have been purchased.

South Yuba Canal Company.—This company started work on a new dam at Bear Valley which will be of granite 20 ft. thick at base and 40 ft. high. The Culbertson Lake above Graniteville is also being enlarged and granite will replace wood in the dam there.

Union Blue Gravel Mining Company.—It is expected that the long tunnel will cut the gravel channel in this mine at North Bloomfield, A. D. Gassaway, superintendent, in 500 ft. The tunnel is in 4,500 ft. About 50 men are employed. A steam locomotive hauls the cars out of the tunnel.

PLACER COUNTY.

(From Our Special Correspondent.)

Beach.—The strike in this mine is a 7-ft. ledge, a few inches of which are very rich. Some of the ore is being shipped to the Selby Smelting works, being packed to the railroad on mules. The find is supposed to be one of the best quartz discoveries made in the county in years.

Bonnie Bee.—A 10-stamp mill has been purchased for this mine at Dutch Flat, J. L. Waggoner, superintendent. The company has 1,400 tons of good ore on the dump.

Hathaway.—This mine at Ophir, one of the oldest quartz mines in the county, is to be reopened. It has been closed for 6 months.

Johnson & Wright.—A good strike has been made in this mine near Auburn. The shaft is 210 ft. deep. The mine is owned by Nathan, John and George Johnson, M. D. Wright and Wm. Valentine.

Never Sweat.—In this mine at Ophir, owned by Andrew and John Johnson, a rich 14-in. ledge has been found at the bottom of the 60 ft. shaft.

PLUMAS COUNTY.

(From Our Special Correspondent.)

N. Borentz is opening a property at the mouth of Mill Creek, and C. R. Thompson is opening one on Rich Gulch. Both mines are near Quincy.

Plumas Mining, Milling and Smelting Company.—This company has secured an option on mill and water rights at Taylorsville, intending to put up a smelter to treat copper ores. The directors are A. Dragovitch, J. L. Wilson, J. J. Martin, E. J. Hass-further and J. N. Flanuisch. Owners of copper mines on this belt are anxious to see a smelter built at Taylorsville or Genessee.

Rich Bar.—At this mine, on the East Branch of Feather River, near Quincy, S. D. Wagner superintendent, two shifts are at work, and good progress is being made in the tunnel.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

Campbell.—Capt. Thompson and L. C. Gilliam, representing Idaho men, have bonded this group of mines at Manvel. This mine was once owned by Mackay, Flood, Fair and O'Brien, but the property did not pay. A. G. Campbell then worked the ore as a free milling proposition. There is a mill, concentrators, 3 shafts equipped with steam hoists, etc., but the machinery is out of date and the new owners contemplate putting up a smelter.

Keystone.—Two Huntington mills and a cyanide plant have been put on this old mine between Sandy and Fenner. The mine is owned by the Schrader-Johnson-Doak Company.

Roosevelt.—In these mines at Ludlow, some 600 ft. of development work has been done and a gasoline hoist erected. It is stated that a 50-ton cyanide plant will be put up.

SANTA CLARA COUNTY.

(From Our Special Correspondent.)

Century Mining Company.—This company, which owns the old Guadalupe quicksilver mines at Guadalupe has been for some time working over the old dumps. It is now pumping out the mine closed for 18 years. The company employs 75 men at present.

Santa Teresa.—This quicksilver mine, between San Jose and New Almaden, is increasing its force of men, and is expected shortly to become a producer.

Silver Creek Quicksilver Mines.—After several months idleness these mines at Silver Creek have resumed operations. A new Scott furnace has been erected near the old one.

SIERRA COUNTY.

(From Our Special Correspondent.)

Bullion.—This mine, at Sierra City, formerly known as the Colombo, and owned by J. Spellenberg, Samuel Devine and Frank Cook, but long idle, has been bonded to W. L. Watts, of San Francisco, who is opening the old lower tunnel. A mill will be erected when the tunnel is repaired.

Butte Saddle.—This quartz mine at Sierra City is now to be managed by Richard Phelan, who proposes to develop it.

Colombo.—This mine, at Sierra City, has passed into control of San Francisco men, and work is to begin upon it.

Empire.—This mine, near Downieville, is to be reopened by Capt. Buckley. The shaft is to be sunk 600 ft. deeper, making 1,000 ft. in all.

Twentieth Century.—At this mine, near Forest City, J. D. Hoff manager, the tunnel is in 450 ft. and is being extended.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

Cherry Creek.—Whip & Loud have sold to E. D. Baker the quartz mine at Yreka recently bought by them from James Ironsides. The property is to be opened up.

Hawkinsville Dredger.—This plant, at Hawkinsville, is undergoing repairs. Oil is to be used as fuel.

Massilon Gold Mining Company.—A 2-stamp Merrill's mill is being built for this company at Black Bear, the mortars, etc., being made in sections for mule-back transportation.

Schroeder Group.—At this group, at Yreka, under management of Reiner & Wallace, 26 men are employed, and the mill is kept running.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

App Mining Company.—At this mine, Jamestown, Capt. W. A. Nevills, owner, a fine body of good ore is opening on the 11th level. The 60-stamp mill continues running steadily.

Confidence.—At this mine at Confidence, Neil Carmichael superintendent, the cyanide plant is treating 100 tons of tailings daily. The mine employs 100 men.

Dutch.—At this mine at Quartz, stoping is in progress on the 1,200-ft. level. New boilers are being put in and oil is to be used for fuel.

Eclipse.—Machinery is being taken to this mine at Groveland, Mr. Berry is superintendent.

El Oro.—A third interest in this mine near Carthers has been sold by Geo. Collins to W. H. Mansfield.

Harvard Mining Company.—At this mine, Jamestown, B. Newcomb manager, Mr. Gorrie superintendent, the 20-stamp mill is running steadily on good ore.

John Royal.—Superintendent Blakely intends putting up a 5-stamp mill at once.

Jumper Gold Syndicate of California.—P. Geo. Gow who has been for some years manager of this property at Stent is succeeded by J. T. O'Brien, as a result of litigation between the company and its late manager.

Lost Fox.—Superintendent Ingalls of this mine at Carthers, expects to have the new 20-stamp mill running early in October.

Mazepa.—It is stated that a 20-stamp mill will shortly be put on this property at Stent, Henry Moore, superintendent.

Mount Hood.—At this mine, Jamestown, J. H. Burckhardt superintendent, miners are drifting and cross-cutting at the 145-ft. level.

Mount Jefferson.—At this mine at Groveland, the new Huntington mill and cyanide tanks are ready.

Republican.—At this mine at Chinese Camp, B. Deleray superintendent, work on the 10-stamp addition to the mill is in progress.

Soulsby.—The man who has this mine under bond and who has been the manager for the past year since he came from Colorado, was recently escorted out of town by the Soulsbyville miners because, as they allege, he had not paid his men for 2 months.

Sell.—W. Divoll and Fulcher Bros. have commenced work on this pocket mine near Sonora.

Toledo.—Capt. W. A. Nevills, of Sonora, and Col. Forsyth have had the shaft unwatered and retimbered.

COLORADO.

CLEAR CREEK COUNTY.

Santiago.—This group of 11 claims and a mill-site in East Argentine District was recently bonded by William Rogers of Frederick H. Minard for the reported sum of \$175,000, to be paid in 3 installments, the first coming due May 1, 1903. The mine was located by Mr. Rogers in 1898.

GILPIN COUNTY.

(From Our Special Correspondent.)

Gilpin Ore Shipments.—The August shipments of ores and concentrates from Black Hawk to the Denver and Golden smelters and to South Clear Creek mills were 409 cars, or 8,180 tons, an excess over the corresponding month of 1901 of 42 cars, or 1,390 tons, a gain of 20 per cent.

Golden Smelter.—Work calculated to double the capacity of this plant, at Golden, has started, owing to the outlook for increased tonnage, from Gilpin and Clear Creek counties. It is expected that the plant will be of sufficient capacity to handle between 500 and 600 tons every 24 hours. F. R. Carpenter is manager for the Clear Creek Mining Reduction Company, with head offices at Boston Block, Denver, Colo.

Iconoclast Mining Company.—A 50-h.p. plant of machinery has been installed on the True Democracy lode and a new shaft building, 20 by 64 ft., erected. Sinking has started, and the shaft is down 100 ft. with promising indications. Denver and local parties are the owners, with H. C. Balsinger, Nevada-ville, superintendent.

Ingalls Gold Mining Company.—Shipments are being made to the Golden Smelter and to the Newton Mill at Idaho Springs, and some ores are being shipped to the Denver smelters. W. A. Ballantyne, Central City, is in charge.

Kansas-Burroughs Consolidated Mining Company.—The August shipments were 248 cars, or 2,108 tons, a daily average of 70 tons, mostly of a milling concentrating character. About 150 men are employed on day's pay and leasing account. P. McCann, Central City, is manager.

Lyons-Kyle Mining Company.—This property, recently purchased by Chicago and Boston parties, is showing up well, and the ores are not shipped at present as the company is considering erecting its own reduction plant. The shaft, now 400 ft. deep, will be sunk another 100 ft. William Woods, of Central City, is manager.

Old Town Mining Company.—A 4-drill Leyner air compressor is being installed at the Old Town Mine, in Russell District, and a new pump is to be put in at the 400-ft. station. Daily shipments are 50 tons to Idaho Springs, and the monthly production averages \$15,000. G. K. Kimball, Jr., Idaho Springs, is manager.

Pewabic.—Berry Brothers, owners of the Saratoga group, have taken a lease and option on this group in Russell District, and are preparing to start operations. Water and the high price asked by New York men have kept the group closed several years. It is a producer of low-grade pyritic ores, which lessees need for the Golden Smelter. Employment will probably soon be given to a large force. F. R. Carpenter, Golden, is manager for Berry Brothers.

Running Lode.—The Gower Mines Syndicate, Limited, is installing an 80-h.p. boiler and is building a large boiler room, and getting ready to sink 100 ft., which will make the shaft 850 ft. The monthly production is 150 tons of first-class concentrating and 80 tons of smelting ores, the latter going over \$100 per ton. About 50 men are employed and the property is being looked after for its English owners by T. Dunstone, Black Hawk.

Waltham Mining Company.—Contract for new shaft building, 25 by 55 ft., has been let to Fred Ballard, of Central City, and a Fairbanks, Morse & Company's gasoline engine is daily expected. Shipments to the Golden Smelter are 25 tons daily, and can be doubled with machinery in. R. H. Hastie, Nevada-ville, is superintendent. The bond and option for \$15,000 has been taken up. Offers have been made ranging from \$30,000 to \$100,000, but refused.

GUNNISON COUNTY.

(From Our Special Correspondent.)

Ben Ezra.—This claim in Mineral Farm Basin in the lime belt, is being developed into a mine. From 10 to 15 ft. of mineralized quartz carries streaks of sulphurette and chloride ore, high in silver. It is operated by R. R. Williams, of Pitkin, and has shipped some ore.

Gold Cup.—The main ore shoot is reported cut in the 9th level. The streak is from 18 in. to 2 ft. wide, and averages high in silver, gold and lead.

Golden Islet Mining Company.—This company is pushing work on its recently acquired property in Jones' gulch in the gold belt near Pitkin.

Pittsburg-Gunnison Mining and Milling Company.—This company is doing some big work at the Yukon in the Gold Belt. A long tunnel is being run to cut the veins in the Yukon and Midnight lodes. The ore carries gold values.

Robert E. Lee.—At this mine, in the Tin Cup District, a 25-ft. vein has been opened, one-third of which is shipping ore, carrying 49 per cent lead and 25 oz. silver and \$2 gold per ton. Two teams are hauling the output to the cars.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Leadville Ore Output.—The total output of all classes of ores averages 2,000 tons daily, much of it low grade lead and zinc sulphides and iron. The tonnage for August was 63,000 tons.

A. M. W. Mining Company.—The August production was 3,000 tons of crude ore, 1,500 tons of zinc concentrates and 375 tons of lead concentrates. The Midas shipped 6,105 tons, the Castle View lessees 475 tons while the new A. Y. & Minnie Mill made 650 tons of zinc concentrates and 445 tons of lead. The mill is now running full force.

Amity.—Local lessees headed by W. S. Harvey et al., are carrying on new work. Sufficient ore is extracted to pay expenses.

Big Evans Mining Company.—No. 2, the new shaft, is down 150 ft. It is located 2,000 ft. from the Hoffer shaft of the combination, which is also to be actively operated. Two large pumps are being put in to handle the heavy water flow. These people are after the extension of the Fryer Hill shoots. They have 150 acres.

Boulder Mining Company.—This New York combination with T. Kyle in charge, is operating the White Cloud group on the north slope of Breece Hill. The new shaft is down 90 ft. A fine plant of machinery is being put up.

Brockway Mountain Group.—This is virgin territory on North Mosquito, E. A. Brockway has done 530 ft. of drifting and has a strong vein of lead ore 2 to 3 ft. wide running from 100 to 200 ozs. silver.

Catalpa-Crescent.—The poor manganese market leaves this company with large ore bodies awaiting demand. Local lessees are shipping 30 tons a day of fair grade iron.

Cloud City Mining Company.—This is one of the downtown propositions now closed. The diamond drill shows ore below the present workings, and arrangements are being made to sink 100 ft. The company before starting work paid \$200,000 for mineral rights on lots in its territory.

Coupon.—This mine consists of 5 claims, including the Little Annie combination of two, upon which extensive work is being done. The owners have 3 tunnels in 75, 80 and 110 ft., and are also sinking 2 shafts. In one tunnel they have just caught a \$40 contact of copper sulphide material.

Dinero Leasing Company.—The company which has been working for 2 years has extracted some \$35,000 worth of ore and expended some \$50,000. Pumping and other expenses have proven too heavy and operations have ceased, temporarily at least.

Estrella Mining Company.—The entire acreage, including the Starr and Bon Air shafts, has been leased for a term of years to T. S. Schlessinger, who heads the Morroco Company interests here. The lease calls for operation of both shafts, which means that extensive pumping plants will be put in and operations conducted by Mr. Schlessinger on a large scale.

Greenback Mining Company.—There is no truth in the report that the American Smelting and Refining Company had purchased this big proposition in Graham Park. The pumps at 1,300 ft. have stopped and the mine was closed by Manager Mulrooney, who could not get a satisfactory price for the ore. There are immense deposits of iron sulphides opened up in both upper and lower workings.

London.—John Kuhn & Co., lessees, have inaugurated entirely new work, including the starting of a 1,000-ft. tunnel to get under the old workings. This will put them 260 ft. below the present working level. A new 600-ft. drift has also been commenced and other new work is under way.

Mayflower.—Lessees headed by Champney, Leist & Gordon are opening the new strike which shows a vein of 40 per cent lead ore with 85 ozs. silver.

Morroco Mining Company.—This is the Sheedy-Kountz combination, of Denver, who put down the A. V. shaft in the downtown basin. They closed temporarily in order to get leases from the city on mineral rights under streets and alleys of their territory. A satisfactory lease has been granted.

Peerless Maud.—The new shaft on the Peerless is entering the mineralized contact at 150 ft.

Reno Mining Company.—The operators headed by Howard Collins are following good ore indications in a drift run from the new shaft.

S. & M. Group.—Local people, headed by A. S. Blake, have just secured a long time lease on this property, adjoining the London Mine. They have the continuation of the latter vein and will develop at that point.

Senator Tabor.—C. H. Tessey, who has been working this group in Little Union Gulch off and on for 6 years, has just uncovered a vein in a new 50-ft. shaft that now shows 1 ft. and assays 20 to 40 per cent lead; 7 to 20 oz. silver and a trace of gold.

Yak Mining, Milling and Tunnel Company.—About 3,000 tons, mostly sulphides, were produced in August. The big bore is in over 1,100 ft. and advancing 6 ft. daily into Ibez territory. A lateral is to be driven to connect with the Rubie.

White Cloud Combination.—This is a group of 28 acres, including the White Cloud, Boulder and Bessie claims. It is owned by Thomas Kyle, who has interested New York capital with him, and a contract has been let to sink the White Cloud shaft to mineral. Indications from previous work point to a large siliceous ore shoot. The property lies on North Brece.

OURAY COUNTY.

Camp Bird, Limited.—The report of this company at Ouray for the period from May 12 to August 12 shows 219,000 cu. ft. of ore treated and 438,000 ft. stoped. The 60-stamp mill crushed 16,840 tons. Receipts were: From bullion, \$319,676; from concentrates, \$102,059; from cyanide, \$25,050; total, \$446,785. Working expenses \$144,128; profit \$302,657. John Hays Hammond, consulting engineer for the company, states that his expectations regarding developments at the mine have been fully realized, and estimates the net value of the ore reserves in sight at fully \$3,000,000 profit. Raises from the 2nd and 3rd levels have shown considerable high grade ore beyond the limits allowed in his estimates of reserve.

PARK COUNTY.

Hock Hocking.—An upraise from the new tunnel is being run to connect with the old workings. Considerable ore was found in the upper workings of this property a few years ago, but on account of the trouble with water the upper workings were abandoned. The tunnel was run in under these workings at considerable distance below. The vein, however, was not encountered at the place where it was expected to be found, and it is thought that it must have been faulty, and at present the upraise is being made for the purpose of discovering which way the vein has gone. The mining men in the vicinity have taken a great interest in the outcome of this property. Mr. William Hill, of Fairplay, is in charge.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

Brooklyn.—Shipments from this mine at Chattanooga have increased from 2 to 3 cars per week, and the force has been doubled.

Gold Bug.—Geo. Bozeman et al. have a lease and bond on this property, on Bear Creek, and are shipping some rich sylvanite ore.

Gold Mine Group.—N. F. Clark has purchased these claims, together with a part interest in the White Cross, all in Burrows Park, from Monroe Brothers, for \$12,000.

Hamer's Lake District.—Excitement is rife in this old section, 25 miles from Silverton, and prospectors are flocking in. No work has been done for many years, until August 1, when some rich specimens were discovered.

Hercules.—This property, on Sultan Mountain, idle for several years, is to resume with a large force of men. Superintendent Snow will again have charge.

Highland Mary.—The North Star vein, on King Solomon Mountain, near Silverton, was recently cut by this tunnel at a perpendicular depth of 2,850 ft., disclosing a fine body of copper and lead ore. The new mill building is finished.

Pyramid.—Mrs. A. L. Cotton, who recently sold these claims to E. P. Ricker, of Poland Springs, Me., has received the final payment of \$20,000. Mr. Ricker purchased the claims to complete the Titusville group, negotiations for the sale of which are now pending to the Guggenheim Exploration Company, the price being given at \$500,000.

Ridgway.—Sherman & Sturgeon have purchased the lease on the Ridgway, and have a large force employed on repairs.

Thunder Bay Group.—Preparations are being made to equip these properties with a complete plant of machinery in the near future.

Tom Turner Group.—This group, consisting of the Tom Turner, Emma and Florence and the Florence M. mill site, was transferred recently under bond and

lease by P. J. Hazlett to George W. Crawford, of New York, and W. F. Mayhew, of Denver. A force of men is now at work cleaning out the old working preparatory to further development.

Tribby Mining Company.—The big tunnel is being pushed toward the Tiger Basin veins by a force of 6 men.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

Alta Mines Company.—The mill has been closed since August 1, undergoing repairs, and its capacity has been increased. In the breast of the main working level the showing is called the best ever known in the history of the mine. The ore is said to average from \$18 to \$20 per ton. A. C. Koch is manager.

Blue Lake.—Work is being pushed on this group, located in Bridal Veil Basin, and the tunnel is being projected at the rate of 3 ft. per day. Six of the leading stockholders of the company, from Kansas City, visited the group recently. W. W. Cramer is manager.

Butterfly-Terrible Mining Company.—This company has leased all the workings above the upper tunnel, and the lessees will start work immediately. The company will receive a royalty of 25 per cent on the net profits, and the lessees agree to keep 10 stamps busy in the mill. The company is pushing the lower cross-cut tunnel. D. B. Sawyer, Ophir, is manager.

Double Eagle.—At this group, in Bridal Veil Basin, the tunnel is in 80 ft., and 3 8-hour shifts are employed. J. B. Litchfield is manager.

Hector Mining Company.—The entire workings, including the Cimarron Mill and the Ophir tunnel, have closed, and about 50 men have been discharged. The company has not been paying the scale of wages adopted by the miners' union and the mine managers. Helpers on the machine drills and engineers received \$3.50 per day, 50c. less than is paid at the other mines. Drivers in the tunnel received \$3 instead of \$3.25. The manager refused to raise wages.

Keystone Hydraulic Mining Company.—Work has been suspended, pending the removal of the giants, but work will commence again soon. C. M. Coleman has charge of the work.

Nellie.—Twenty stamps in the big mill in Bear Creek Basin, about ½ mile below the mine, are dropping, and the force at the mine has been increased. The mill run is a test of a large body of low-grade ore that was recently encountered. Cooper Anderson is manager.

Ophir-Tidal Wave Mining Company.—The officers and incorporators are C. E. Tompson, S. A. Huntington, R. B. Lewis, L. M. Howe, A. Andrews, V. O. Taylor and L. M. Hart, all of Boston, Mass. They will operate the Tidal Wave group of 6 claims, near Ophir, purchased from the Ophir Needles Mining Company, for \$10,000. The principal offices will be in Denver.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Empire State Consolidated Gold Mining Company.—It is understood that regular shipments of good grade ore are made. The property includes that owned by the old Orphan Belle Company, and is situated on Bull Hill near the Isabella. Geo. D. Kilborn, of Colorado Springs, is general manager.

Free Coinage Gold Mining Company.—Little work is being done and none on company account. Until quite recently, the property has been under lease to Judge L. H. Goddard, of Denver, who took out a large amount of ore. At present a few lessees are working in a desultory way without definite leases, and are taking out a little ore. The property is owned principally by the estate of the late Sam Strong and comprises a good acreage on Bull Hill, principally in the town of Altman.

Last Dollar.—The rumors of a sale of this and the Modoc property adjoining are denied. Engineers recently made a very thorough examination of the Last Dollar, but for what reason has not been given out. Both properties are on Bull Hill, and have produced a large amount of ore. The main shaft of the Last Dollar is down 1,200 ft., a large amount of drifting has been done and sometime ago very good ore was shipped from the 1,000-ft. level.

Morning Star.—It is understood that a 60-day option has been given Mr. Hemming. At one time this property on Beacon and Guyot Hills, was supposed to contain the continuation of the rich O. K. and El-paso vein.

Pharmacist Consolidated Gold Mining Company.—At the annual meeting in Cripple Creek the following directors were elected: A. Wagner, A. C. Dutcher, E. P. Arthur, E. R. Whitmarsh and G. M. Fay. The property is all worked under lease, and a fair amount of ore is shipped. Mr. Wagner was elected president and general manager; Mr. Whitmarsh, vice-president; Mr. Arthur, treasurer, and Mr. Fay, secretary. The only change in the directorate was that A. C. Dutcher

was elected in place of Dr. Chambers, who has moved to California.

Sheriff.—A surface deposit of good ore of considerable size, has been opened by Geo. E. Wrockloff, well known as a lessee, who formerly made considerable money on the Burns, Lillie and other properties. Some good ore is also being mined on the Amanda, adjoining the Sheriff. The strike on the War Eagle, in the same vicinity, is holding out well.

Zenobia.—The work of installing new machinery and building the shaft house is almost completed. A deep shaft is being sunk by W. S. Stratton, the owner, not far from the Pharmacist working shaft. Considerable ore has been taken out in former years, principally from the old Pharmacist-Burns vein, one of the first opened on Bull Hill.

GEORGIA.

LUMPKIN COUNTY.

Messrs. Ingersoll, Crisson & Keanum have bought the Breymann dredge on the Chestatee River, and are now operating. They have also purchased material for an additional boat.

Jones Gold Mining Company.—This company has paid off the \$5,000 mortgage held by Capt. R. R. Asbury on its Cavender Creek property. The company has begun work on the ditch which will carry water to the property.

IDAHO.

BLAINE COUNTY.

Legal Tender.—Samuel French, of Hailey, and Frank Gardiner, of Iron Mountain, Mich., have taken a bond for one year on the Legal Tender group of mines, near Broadford, about 4 miles south of Hailey. This group, owned by Henry Warren and Henry Allison, consists of 10 claims in one block. It adjoins the Minnie Moore.

IDAHO COUNTY.

Atlas.—This group at Hump, owned by Parisot & King, of Spokane, is being developed by a large force of men. The owners contemplate running a tunnel 500 ft. to tap the ore body at depth.

Baby Louise.—This mine at Hump, recently bonded by Spokane men, is being developed rapidly. Fifteen men are driving the tunnel and making other improvements. Next spring a stamp mill will be installed.

OWYHEE COUNTY.

Trade Dollar Consolidated Mining and Milling Company.—The Dewey Tunnel, near Silver City, has cut the old Black Jack vein under Florida Mountain. The vein was cut at 300 ft. below the old Blaine workings, or 1,700 ft. beneath the apex, and at about 14,000 ft. from the entrance. Joseph H. Hutchinson is manager.

INDIANA.

CRAWFORD COUNTY.

(From Our Special Correspondent.)

Indiana Oil Wells.—The shipments of oil from Indiana for August were the largest of the year, being 983,962 bbls., which at the market price is valued at \$826,529. The runs of oil for the same month were 780,591 bbls. The shipments for the first 8 months of the present year amounted to 7,462,661 bbls., valued at \$6,111,152.

Oolitic Portland Cement Company.—This company has been organized at Marengo and has purchased 147 acres of land. The company uses 23 per cent clay and 77 per cent oolitic limestone. Another company, at Mitchell, is turning out 2,000 bbls. of Portland cement a day.

DAVISS COUNTY.

(From Our Special Correspondent.)

Wilson Company.—This company's coal mine, south of Washington, is on fire, and all efforts to check the flames have failed. Boys are charged with having started the fire.

GREENE COUNTY.

(From Our Special Correspondent.)

Letsinger Coal Company.—This company, near Jasonville, has pierced the No. 5 seam at a depth of 50 ft. and found good coal 9 ft. thick, with an excellent roof. The company controls 1,150 acres of coal land, and will at once sink a 200-ft. shaft.

Panhandle Coal Company.—This new coal and mining company has been organized at Linton. It was organized by D. J. Terhune. Most of the stockholders are Indianapolis men. They have purchased 800 acres of good coal land five miles west of Linton and will open up shafts at once.

KANSAS.

LA BETTE COUNTY.

(From Our Special Correspondent.)

A company, composed of J. E. Stillwell, of Pittsburg, Kan., and R. K. Pitkin, of Pittsburg, Pa., and C. D. Richardson, of Joplin, Mo., has leased 4,000 acres southeast of Oswego and ordered machinery to drill for oil and gas. The field may be slightly outside the limits of the Kansas oil and gas field, but

has long been thought likely to prove profitable. The only drilling heretofore done at Oswego has been in the uplands.

LOUISIANA.

ACADIA PARISH.

(From Our Special Correspondent.)

Jennings Oil Wells.—Well No. 2 of the Jennings Heywood Syndicate came in without bailing on August 23, throwing oil 100 ft. in the air. It adds about 200 ft. to the proven area; its depth is about 1,850 ft.

MINNESOTA.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Colonial Iron Company.—This company's mines, the Hale and Kanawha, are not doing much. Kanawha has shipped less than 10,000 tons, Hale about 50,000 and Roberts about 30,000 tons. The three are expected to produce 125,000 for the year.

Pickands, Mather & Company.—The 8 mines on the range now owned and operated are: Sparta, Malta, managed by J. O. St. Clair; Elba, Corsica, managed by W. P. Chinn; Minoroca, managed by Jas. Roskilly, and the new Utica and Albany, managed by W. H. Downing, and the new Troy, managed by Jas. Reed. The Sparta and Malta open pit mines at Sparta, have shipped this year about 300,000 tons; and should ship more than twice that in order to maintain estimates. The Elba and Corsica, Elba, and are both underground, the Corsica being very wet. They have shipped so far about 200,000 tons of an estimated allotment of 325,000 tons. The Minoroca was bought by the firm three years ago and is just opened; the season's production may amount to 35,000 to 40,000 tons. It is a high grade ore of considerable value, but the body so far as explored, is not large. The Troy at Eveleth is being opened for next year. It and the Utica and Albany, which are at Hibbing, are all underground. They are operated by the Crete Mining Company. Pickands, Mather & Company are also exploring the Elizabeth, the w. 1/2 of the nw. 1/4 of section 12, T. 57, R. 21, proving the work done by the original holders of the lease. These holders proved up 11,700,000 tons of 58 per cent ore, some being bessemer, and have optioned to this firm for \$350,000. The property is state lease, paying 25c. a ton to the state school funds on a 5,000-ton minimum.

Stevens.—This property will not become a shipper of importance this year, though it was looked on to produce 100,000 tons, but will ship largely in 1903. Wm. Schultz, who has been at Mountain Iron, is now superintendent of the property.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—The past week was unusual in many respects. The tonnage sold of lead ore was the greatest of the year, but there have been only 3 weeks this year when there was a smaller shipment of zinc ore. Although the shipment was 635 tons below the average for the year, it is not probable that more than 300 tons were added to the reserve stock at the mines. Many of the largest mills in the district have stopped, while the owners are pushing development work and awaiting a stronger market. The King Jack Mine, in Joplin, now has \$20,000 worth of ore piled up in the bins from the August productions, and other mines are pursuing a like policy.

The best price paid for zinc ore in Joplin was \$38 per ton, for the high-grade output of several local mines; the assay basis was cut \$1.50 a ton on a 60 per cent basis, and little ore was taken at that low figure. The big output of lead is due to the steady price and mine operators giving their attention to lead. For the corresponding week last year the shipment of zinc was greater by 622,100 lbs., the lead shipment less by 390,900 lbs., and the total value less by \$46,880. For the corresponding 36 weeks of last year the lead shipment was greater by 2,595,980 lbs., the total zinc shipment less by 13,817,130 lbs., and the total value less by \$1,126,755.

Following are the sales from the various camps of the Joplin District for the week ending September 6.

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,545,570	396,520	\$52,990
Galena-Empire	1,210,850	255,180	23,869
Cartersville	1,541,900	474,340	35,402
Oswego	248,670	49,040	5,437
Aurora	360,350	14,900	5,758
Spurgeon	271,630	13,100	4,124
Zincite	130,850	11,600	2,599
Central City	201,220	2,210	2,569
Ducweg	1,137,830	147,510	26,297
Prosperity	221,470	28,990	4,537
Neck-Alba	184,320	16,670	3,558
Cave Springs	118,270	7,980	2,116
Granby	493,000	51,500	4,700
Carthage	116,370	14,370	2,330
Carl Junction	801,630	.....	5,228
Fortuna	.....	226,600	5,552
Stettis City	46,600	.....	792
Total	9,130,530	1,708,550	\$190,454
Total 36 weeks	373,288,100	44,817,950	\$6,562,920
Zinc value, week	\$148,600	lead, \$41,777	zinc value, 36 weeks, \$5,564,925; lead, \$998,004.

H. R. Chitwood has contracted to sell to S. Duffield Mitchell, of Pittsburg, Pa., a small fee in the center of the recent rich strikes made by the Des Plaines Company and others, near Lehigh. The consideration will be \$12,750.

J. W. Tate and A. V. Boswell, of Joplin, have purchased 80 acres belonging to S. Zimmerman, 6 miles east of Joplin, the consideration being \$6,000. The land is located near Duenweg and will be prospected at once with the drill.

Mohaska.—An unexpired 10-year lease on the Mohaska tract of 160 acres, south of Joplin, has been sold to M. B. Coburn for \$25,000. The sale includes all the machinery. There were formerly a number of small mines on this tract, but the ground has been idle some time.

MONTANA.

MADISON COUNTY.

Bismarck & Nugget Gulch Gold Mining Company.—This company is preparing to start its 60-ton mill and 30-ton smelter, situated 3 miles from Sheridan. A shaft has been sunk 300 ft.

SILVER BOW COUNTY.

Alice.—The concentrating plant at Butte owned by this company, was destroyed by fire recently. The loss is put at \$100,000.

NEW YORK.

ORANGE COUNTY.

Layton-Franklinite Zinc Company.—This company has been organized to develop a deposit of zinc ore said to exist on the Layton farm, near Amity. The officers are: John W. Simpson, president; M. N. Kane, vice-president; C. Macardell, treasurer; M. L. Woodward, secretary.

NORTH CAROLINA.

GUILFORD COUNTY.

(From Our Special Correspondent.)

Deep River.—This old gold and copper mine, 4 miles east of High Point, has been sold to parties from New York City and Danville, Va. They have made new openings on the course of the vein, which runs through their 228-acre tract.

BOWAN COUNTY.

(From Our Special Correspondent.)

Gold Hill.—This copper mine has lowered the water in the Randolph shaft to the 600-ft. level and has a body of ore that runs well in gold and copper.

Whitney Reduction Company.—This company is down 600 ft. in its new shaft and is producing ore.

OREGON.

JOSEPHINE COUNTY.

(From Our Special Correspondent.)

Victor Junior.—The owners of this property in the Grave Creek District have changed the name of their corporation from Victor Junior Mining Company to Greenback Gold Mining Company, incorporated under the laws of Arizona. They are building a new 20-stamp mill at the foot of the mountain below the present 15-stamp one, which will be reduced to a 5-stamp and used for sampling purposes only. The mine is opened by tunnel and shaft to a depth of 800 ft.

Waldo Smelting and Mining Company.—Copper mines at Waldo are being well developed. The company is preparing to build a larger smelter, and has completed preliminary survey of railroad from Grant's Pass to the mines.

PENNSYLVANIA.

BITUMINOUS COAL.

Beech Creek District.—Shipments of coal in August amounted to 679,670 short tons, making 4,143,952 tons since January 1. The coke movement totaled 18,196 tons in August, and 133,240 tons in the 8 months of this year.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Black Hills Porcelain Clay and Marble Company.—The first car of mica shipped to Cleveland, O., weighed 30 tons and brought \$2,250. Channelling machinery is being installed at the lithograph stone quarry and the company will soon ship slabs. Four gold ore claims have lately been purchased and prospecting has begun.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Golden Crest Mining Company.—Ground has been broken for the 100-ton cyanide plant at the head of Two-Bit Gulch. Work has been stopped in the mine pending the completion of the mill.

Golden Reward.—The Sundance Mine in Ruby Basin is closed owing to a fire, that started in the stable. Considerable damage was done to the mine timbers. The Sundance is connected with the Fannie

and Tornado Mines of the Golden Reward and the Lucile and Mogul shafts of the Horseshoe Company, and work had to be suspended in the latter properties temporarily, on account of smoke and gas.

Hidden Fortune Gold Mining Company.—Rich ore is reported found in the siliceous measures on claims purchased of Otto P. Th. Grantz, and nearly 5 acres has been stripped of the loose surface rock and earth. Churn drill holes have been put down at intervals of 10 feet, to be used in blasting down the ore later. The ore lies in a horizontal blanket, from 4 to 15 ft. thick. The company is preparing to sack the ore for shipment to a smelter. A shaft has been started on the Bingham claim, near the Baltic tunnel, to explore the Bingham ledge at greater depth. A cross-cut from the Baltic tunnel has been driven across the vein at an average depth of 500 ft. The vein is a vertical, in the schists.

Home Mining Company.—A shaft has been started on City Creek, in Deadwood. A ledge of pyrites, carrying iron, copper and a few dollars a ton in gold is reported. It is fluxing ore. The company is installing a hoist and pump.

Imperial Mining Company.—Preparations are being made to ship ore from the Eagle Chief property, recently purchased at Crown Hill Station to the Deadwood cyanide plant. The Burlington is putting in a switch and loading station.

Jupiter Gold Mining Company.—Arrangements have been completed for the cyanide plant on Blacktail Gulch. It is to be put up with a view to enlarging to 500 tons capacity within a year.

Oro Hondo Mining Company.—Machinery is arriving for the hoisting plant at Kirk. The Burlington Railroad has built a spur to the site to facilitate the delivery of supplies. The shaft is 60 ft. deep and in ore.

Portland Mining Company.—The lease on the Baltimore & Deadwood Mill at Gayville has been surrendered, owing to its purchase by the Columbus Consolidated Gold Mining Company. The Portland has been running the mill 2 years. Prospecting will continue in the mines of the Portland Company, and the higher grade ore shipped to smelters for the present.

Ruby Gulch Mining Company.—James Conzett, superintendent, has a number of miners blocking out ore on the Portland claim, near the head of Strawberry Gulch.

Specie Payment Gold Mining Company.—A bond is held on the Dakota Maid group of claims, adjoining the Gilt Edge of this company, and a force of men is engaged on development. The first payment has been made to Mrs. Joseph King, owner of the Dakota Maid.

Victoria Mining Company.—A shaft has been started on the Squaw Creek property, and is being equipped with steam hoist and pump. A. J. Malterner and George S. Jackson, of Deadwood, and A. B. Smith and W. B. Glass, of Omaha, are the principal stockholders.

Wasp No. 2 Mining Company.—Semi-monthly clean-ups are being made at the 100-ton cyanide plant on Yellow Creek on Potsdam sandstone ore.

TEXAS.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Beaumont Oil-field.—The car situation is easier, and shipments are on the increase. Some 60 wells are being pumped, and more oil is now available. August shipments will show an increase over July. Some consignees of crude complain of water received in tank car shipments. It is undisputed that wells in blocks 36, 37 and 38 H. S., are pumping water with the oil. The San Jacinto Oil Company brought in a new well on the Yellow Pine tract. There are now about 282 wells on Spindletop. The situation on the hill is rendered very hazardous. Dozens of men are knocked out by the gas caused by settling tanks, and the danger from fire has vastly increased. Prompt action is necessary to avoid disaster.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Settlement.—For the week ending September 6 the Salt Lake banks report as follows: Bullion, \$116,100; gold, silver, lead and copper ores, \$178,900; gold bars, \$10,700; auro cyanides, \$3,500.

BEAVER COUNTY.

(From Our Special Correspondent.)

Horn Silver.—This mine at Frisco shipped 4 cars of its best quality shipping ore during the week ending September 6. The force has been reduced to about 50 men who are on development. There is much interest in the prospect of a smelter being erected for the mine output and custom work.

JUAB COUNTY.

Ben Butler.—This mine shipped in August 525 tons of ore.

La Clede.—The shaft at this mine, near Silver City, is down 525 ft. A station is being cut at the

500-ft. level, where a large Knowles duplex-condensing pump will be installed.

Mammoth Mining Company vs. Grand Central Mining Company.—In this suit in the Federal Court, Judge Marshall has decided in favor of the Grand Central by refusing to issue an injunction and dissolving the temporary restraining order already issued. The suit was brought for the purpose of quieting the Mammoth Company's title to part of a vein alleged to line in the Silveropolis and Consort claims, to restrain the Grand Central from trespassing on this vein and to secure an accounting for damages alleged to have already been sustained through trespasses. The Grand Central Utah corporation set up by answer and the Grand Central Colorado corporation by plea as a defense the bar of the former adjudication in the State courts in a suit involving the same premises.

Judge Marshall said in his opinion: "The owner of a mining claim owns not only all lying vertically beneath his surface, which has not been reserved or carved out of his claim and granted to others, but also he may own a vein which, on its dip, widely departs from his claim as delimited on the surface. The vein on its dip beyond the bounding planes of his claim extended downward vertically, is, by his ownership, severed from the estate of the owners surrounding it. It is a distinctly entity capable of being described without reference to the claim in which the apex lies." The case will probably be carried to the United States Supreme Court.

South Swansea.—This mine at Silver City has been closed and the entire working staff laid off. No reason is given.

(From Our Special Correspondent.)

Tintic Shipments.—The output for the week ending September 6 was as follows: Bullion Beck, 10 cars; Gemini, 10 cars; Star Consolidated, 3 cars; Grand Central, 11 cars, Carisa, 4 cars; Eagle & Blue Bell, 2 cars; Mammoth, 5 cars; Martha Washington, 1 car.

Grand Central.—A sale of 14,000 shares from the holdings of the Cameron estate at \$5 per share, has been made to Col. C. E. Loose, W. S. McCornick, Judge Dickson and others.

Mammoth.—It is said that rich rock from the ore body on the 1,300-ft. level is coming to the bins.

PIUTE COUNTY.

(From Our Special Correspondent.)

Annie Laurie.—The enlarged mill has gone into commission this week and no one questions the ability to increase the treatment to 10,000 tons monthly with the added capacity. The miners who were laid off have been reinstated.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—Shipments for the week closing September 6 were: Bingham Consolidated, 2 cars ore; Niagara, 4 cars ore; Storey, 3 cars ore; Moscow, 1 car ore; B. C. & G., 2 cars ore.

The Maxfield in Big Cottonwood shipped 2 cars of ore.

Bingham Copper and Gold Smelter.—In the week ending September 6 shipments were 3 cars of copper bullion or approximately 180,000 lbs.

Utah Consolidated Smelter.—The output for the week closing September 6 was 4 cars of bullion approximating 240,000 lbs.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—The ore marketed through the Mackintosh sampler for the week ending September 6 was as follows: Silver King, Loring, 158,360 lbs. ore; Ontario, 791,280 lbs. ore; Daly-West, 2,308,850 lbs. ore; Silver King, 1,435,730 lbs. ore.

Comstock.—This Park City property is figuring on a new concentrator. A local banking house has furnished the capital, it is understood.

Little Bell.—This property that joins the Daly West on the southwest has broken into the ledge of ore long sought. Manager Spiro reports the ore the same as the Quincy. The Daly West Company owns a 1-5 interest and Simon Bamberger is interested.

New York Bonanza.—This company of Park City, with 300,000 shares of \$1 each, will work a group of claims covering the Naildriven vein. Robt. G. Wilson is president, Herman Barnett is secretary and treasurer.

TOOELE COUNTY.

(From Our Special Correspondent.)

Fish Springs Shipments.—The Utah shipped 2 cars lead-silver ore for the week ending September 6.

Stockton Shipments.—During the week ending September 6 the Ophir Hill reports the sending to the samplers at Salt Lake 20 cars of concentrates while the Honerine sent 1 car and the Stockton 1 car.

VIRGINIA.

WYTHE COUNTY.

Wythe Lead and Zinc Mine Company.—This com-

pany's property, near Wytheville, was recently sold to the Bertha Zinc Company, of Pulaski. The property was worked for lead first about 1750 by Col. Chiswell, of the English army. Until 1887 the product of the mines was hauled in wagons to Max Meadows for shipment to market, and the mining machinery used was of the crudest kind, but improved machinery was installed in 1890. The land was first worked for zinc about 20 years ago. The 20,000 shares of stock of \$20 each were sold to the Bertha Zinc Company for \$450,000 cash. Capt. John C. and William Raper owned over one-third of the entire stock. Among the next largest owners were the Whites, of Abingdon and Washington County, the heirs of Maj. David P. Graham, and Maj. John W. Robinson, of the Virginia Iron, Coal and Coke Company. Capt. John C. Raper has been in the employ of the company and owners of the mine for 47 years, 37 years of that time as superintendent and manager.

WEST VIRGINIA.

Coal Miners' Strike.—The strikers have lost ground fast of late and the strike is on its last legs. The miners in the Pocahontas District on September 4 at a meeting at Keystone voted to return to work. The strike had been on since June 6 and ends in what is practically total defeat for the strikers. The strikers in the New River fields returned to work September 8, and it is not thought that the men in the Clarksburg District and in the Kanawha Valley will hold out much longer.

MINGO COUNTY.

A block of coal lands controlled by Judge E. S. Doolittle and the Ensign estate, of Huntington, and Everett Leftwich, of Williamson, has been sold to a syndicate of Ohio coal operators and dealers, composed of Horace Chapman and Jones & Jewett. The purchasers will develop the coal at once. The tract contains 5,000 acres and lies on the Norfolk & Western about 3 miles west of Williamson. The purchase price is reported as \$100,000.

WISCONSIN.

DOUGLAS COUNTY.

(From Our Special Correspondent.)

John T. Gates, who has taken an option on certain copper bearing lands in the southeast part of this county, has ordered machinery equipment as follows: A 6-drill compressor, 2 hoisting plants, 120-h.p. boiler capacity, 35-h.p. engine and 4 air drills. No. 1 shaft is down 90 ft. in a brown amygdaloid that shows copper, and No. 2 is 40 ft. in a lean amygdaloid. The shafts are 700 ft. apart and will both be sunk deeper. The exploration has a promising look, but it will be sometime before anything can be definitely said as to its prospects.

WYOMING.

CARBON COUNTY.

Albany.—This group of mines in Douglas Creek District has been sold by William Benton to the American Copper Company. The price is given as \$105,000. The group comprises 100 acres of ground in the vicinity of the Rambler Mine.

FOREIGN MINING NEWS.

AFRICA.

RHODESIA.

The report of the Chamber of Mines for June shows 7 mines in operation, with 172 stamps running. The total ore milled was 22,484 tons, the average duty being 4.85 tons per stamp per day. The total of tailings cyanided was 13,761 tons in 5 plants. The total yield in gold bullion was: Mill, 12,923 oz.; tailings, 2,828 oz.; miscellaneous, 91 oz.; total, 15,842 oz. For the six months ending June 30 the total yield was 99,049 oz. crude, equal to 88,153 oz. fine gold, or \$1,822,122.

With regard to native labor in the mines, the executive committee reports as follows: "It having been reported that unauthorized persons have been spreading false reports among the natives at the mines that they will receive £4 a month if they went to Johannesburg, with a view to enticing them there, your committee wrote to the Chief Native Commissioner asking him to inform the natives through the various native commissioners that in only exceptional cases are natives paid more than 1s. per day on the Witwatersrand fields. A reply has been received stating that instructions have been issued to all the native commissioners in the Province of Matabeleland to inform the natives accordingly.

"The Chief Native Commissioner furnishes the following figures for the month of June, applicable to Matabeleland only: Natives employed above ground, 2,618; below ground, 4,109; specially employed, 185; total, 6,912. In the above figures natives employed in the mines in the Bulawayo and Lower Gwelo districts are not included. These are estimated at 700, making a total of 7,612 employed on the mines alone.

"The following is a summary of the returns sent in by 15 companies to the Chamber for the month of June: Natives actually employed June 30, 4,262; engaged during the month, 2,308; discharged, 726;

deserters, 615; required to complete (underground), 450. Natives in the employ of contractors and prospectors, and those engaged in cutting wood, are not included.

"The supply of surface laborers continues equal to the demand, but for mining work the quality is as unsatisfactory as ever, and, as will be seen from the above figures, the percentage of desertions equals that of any previous month, and is mainly due to desertions by Zambesi and local natives, the Shangaans remaining steady at their work."

ASIA.

INDIA—MYSORE.

Kolar Gold-field.—The production of gold in July showed a marked improvement, owing to a better supply of water. The total was 43,847 oz. crude, being 6,381 oz. more than in June. For the 7 months ending July 31 the total was 270,975 oz. crude, against 294,368 oz. in the corresponding period in 1901, showing a decrease of 23,393 oz., or 7.9 per cent. The total this year was equal to 243,878 oz. fine gold, or \$5,040,958.

AUSTRALIA.

QUEENSLAND.

Mount Morgan Gold Mining Company.—The *Australian Mining Standard* says: "The directors of this company are vindicating their reputation for enterprise by initiating some modern improvements. As the result of the visit of Messrs. G. A. Richard and H. P. Seale to the United States, they have ordered a steam shovel, which will weigh 65 tons, and will lift a cubic yard of earth at a time. These steam shovels are in use at the Lake Superior iron mines. It is believed that very satisfactory results will also be obtained at Mount Morgan. Three locomotive engines, two to draw the cars, and one to operate the shovel, are also ordered. This plant, it is expected, will be of great service in removing the overburden from the open-cut. Three diamond drills, which will be used for prospecting the mine at depth, have been ordered, and the working plant is to be further strengthened by the addition of two electric drills. The bill for the new machinery will be a pretty heavy one, but it is expected that it will prove a profitable purchase."

WESTERN AUSTRALIA.

Gold output in July is reported at 160,294 oz. crude, making a total for the 7 months ending July 31 of 1,018,407 oz. crude. This is equal by values to 923,151 oz. fine gold, or \$19,081,553.

CANADA.

BRITISH COLUMBIA—SLOCAN DISTRICT.

Slocan Ore Shipments.—The total amount of ore shipped from the Slocan and Slocan City mining divisions for the year 1901 was, approximately, 30,000 tons. Since January 1 to August 30, 1902, the shipments, according to the *New Denver Ledger*, have been as follows:

	Week.	Total.
Payne	20	890
Ivanhoe	...	295
Sunset (Jackson Basin)	21	744
Reco	...	322
American Boy	40	656
Arlington	60	2,689
Hewett	...	765
Bosun	...	770
Last Chance	18	168
Wonderful	...	151
Enterprise	...	1,600
Lavina	100	85
Bismarck	...	42
Queen Boss	...	180
Silver Glance	...	77
Whitewater	...	2,733
Ottawa	...	8
Capella	...	20
Florence	...	1
Trade Dollar	...	20
Slocan Boy	...	115
Neepawa	...	101
Hartney	...	25
Marion	...	80
May	...	5
Paystreak	...	7
Surprise	...	22
Monitor (for Aug.)	105	870
Slocan Star	25	553
Duplex	...	7
Emily Edith	...	20
Wakefield	...	140
Freecott	...	4
Rambler	126	3,486
Mcilly Gibson	...	1,500
Washington	...	187
Follott	...	2
C. O. D.	...	2
London Hill	...	115
Ruth	60	468
Antoine	...	20
R. E. Lee	...	60
Spectator	...	4
Red Fox	...	20
Hampton	4	4
Total tons	579	20,033

NOVA SCOTIA—CAPE BRETON.

Dominion Coal Company.—This company reports that its coal shipments in August were 306,178 tons. For the 6 months of the fiscal year, from March 1 to August 31, the total shipments were 1,526,122 tons, against 1,300,229 tons in the corresponding period of 1901, and 1,043,200 tons in 1900.

MINING STOCKS.

(Complete quotations will be found on pages 364 and 365.)

New York. Sept. 12.

There has been a perceptible change for the better in the copper group, owing to reports of an improvement in the metal market. While there is increased buying of these shares and a hardening in prices, it cannot be said that the outside public is investing much money. Judging from the way prices move it appears the speculators and supporters of these shares are making ready for an early revival in the market. Amalgamated is changing hands somewhat more actively than for some time past, and at better prices. Sales were reported this week at \$69@71½. Anaconda has also recovered, selling in a moderate way at 107@110¼ per cent (\$26.50@27.56¼). On curb the market is strong, and fairly large sales have been reported. Greene Consolidated, of Mexico, brought \$28½@29, United, of Montana, \$31¼@32½, Tennessee, \$17½@19, White Knob, of Idaho, \$19½@21; British Columbia, \$4½@6, and Montreal & Boston, \$3½@3¾.

Ontario Silver, of Utah, reappeared with sales at \$8¼@9, and Alice, of Montana, at 30c. The latter stock has weakened since the destruction by fire of the company's plant recently.

Gold shares are uninteresting. Portland, of Cripple Creek, Colo., sold at \$1.85@1.90, Elkton at 38c., and Isabella at 34c.

Auction sales were 200 shares American Smelting and Refining Company common at \$46½ per share; 300 shares Amalgamated Copper Company at \$69½; \$11,000 6 per cent bonds of Indiana Natural Gas and Oil Company at 65c., and 35 shares Electro-Gas Company at \$1.17.

Boston. Sept. 9.

(From Our Special Correspondent.)

Since the publication of the Ledoux statement relative to the supplies of copper a better feeling has prevailed, and the copper share list has been buoyant throughout. The prices of shares have risen from \$1 to \$20, the latter being Calumet & Hecla, which is up to \$555. Quincy has advanced \$10 to \$135, Osceola \$6 to \$62, Tamarack \$7 to \$179, Copper Range Consolidated \$2.37½ to \$60.75, Mohawk \$3.75 to \$49.25, and others have shown smaller but proportionate gains.

As yet the traders are working the market, but the public is showing a disposition to venture into it. Leading brokerage houses wired Western customers that the market looked right for an advance a week ago, and a good many orders have been received from this contingent. To-day the tone of the market was less artificial than the preceding day, and sales were more real. Stocks are being taken out of the market, and brokers, as a rule, feel that the advance will continue and be easier if the price of Amalgamated will allow. It is felt that a powerful pool is working in the last-named stock, which touched \$71.12½ in the market to-day. It is known that orders have been given to cover large lines of short contracts in this stock; thus the extra bullish feeling that prevails in copper share circles.

The mask that has covered the real situation has been removed, and it is now felt that the supply of copper is much smaller than was really known. Those who for months past have been patiently awaiting an improvement in the market for copper shares are at last rewarded, and if things are as they seem Boston will soon be in the midst of an active copper boom. This, at any rate, is the feeling at present, but it is subject to sudden change. There is no doubt of the improvement in the metal situation. Calumet & Hecla people are said to have refused 12c. for copper, and mining companies are refusing to sell ahead much.

United States Mining has again been an active feature, gaining \$1.12½ to \$22.87½, based in part upon the near approach to the mines going up a producing basis. There has been considerable buying from Utah. The people connected with this property have organized the United States Smelting Company in Maine with \$1,000,000 capital. The stock is all owned by the United States Mining Company. Utah Consolidated has taken on more animation, and has risen \$1.75 to \$23.50.

Centennial has advanced \$1.87½ to \$19.37½, Atlantic \$2 to \$28, Adventure \$2 to \$24, Parrot \$1 to \$28, Trinity 62½c. to \$12.37½, Shannon \$2.37½ to \$11.37½, Old Dominion \$1.50 to \$19, Bingham \$1.75 to \$32.75, and Mass 75c. to \$18.25. A selling movement drove Winona down \$1 to \$4.25 to-day. Activity has ceased in Dominion Iron and Steel somewhat, yet the stock recorded a \$5.50 fluctuation from \$72.50 to \$78, closing at \$74.75. Dominion Coal is favored with a semi-annual dividend of \$4, which is its first. Daly West has declared the usual monthly dividend of 60c., and the stock has moved up \$1 to \$53. Mass mining is said to be operating at a profit with copper at 12c. Isle Royale touched \$15, and the company is said to be treating the rock for \$1.24 per ton.

Colorado Springs. Sept. 5.

(From Our Special Correspondent.)

Everybody in the local field is talking mining boom this week because of the sudden advance which has been made in shares. While it is true that some noteworthy advances have been reported and on the whole the market has made a substantial and very encouraging gain, nothing has yet developed to warrant the statement that anything like the boom of four years ago has set in. A comparison of the list of prices with those of a week ago shows that almost every stock great and small has gained something, from the fraction of a cent as in the case of the prospect stocks to 38c. a share in Portland; but while all this is very encouraging, there is nothing in it to get excited about or cause a stampede. The market has improved and the brokers have made the most of it. It looks as if Cripple Creek was again to make money for the investor and speculator, but the eastern trader need not get alarmed nor fear that all the good things have been picked up this week. It can be stated that buying orders from the East are again coming in in good numbers, the first that have put in an appearance for months in any amount and this without doubt is the greatest element of strength about the market.

A careful comparison of prices of 45 principal stocks at the end of August with those of the same stocks on the first day of that month indicates a net gain of approximately 25 per cent over the quotations of August 1. The point to be made is that stocks have been and probably will gradually improve, but all this talk of boom times should be discouraged for it always works against the investor farthest removed from the scene of activity.

As for the market itself, Portland led in the advance, selling from \$1.87 on August 30 up to \$2.25, a gain of 38c. a share, meaning an advance of over \$1,000,000 in the value of the capital stock. The improvement is caused by the strong probability that this company will be able to resume its regular dividends. The next advance was made in El Paso, which sold from 67½ to 72c. yesterday, dropping to 69¾c. to-day. Yesterday's gain was largely professional. The mine will resume in full this month.

C. K. & N., a Beacon Hill mine adjoining the El Paso, gained from 7@7¼c. August 30 to 9¼c. September 4, receding to 9c. to-day. This little property is making an excellent showing under the leasing system, the lease, however, being owned by the owners of the major portion of the capital stock. Gould advanced from 4¼c. to 5½c., the high point being reached to-day. Gold Dollar Consolidated went from 3¼@4¼c. last week to 4½@5c. this week, on quotations and little selling. Mollie Gibson, one of the Aspen silver favorites, was quoted from 4@4¼c. up to 5@5½c. Pharmacist went from 3¼@4c. up to 4¾@4¾c. These low priced stocks indicate how the general market advanced.

Isabella sold from 36½c. up to 37½c. yesterday and closed at 36½c. on the last call to-day. There was buying for the inside the beginning of the week and selling later. Elkton failed to keep up, selling listlessly all week between 36¼c. and 37c.

Salt Lake City. Sept. 6.

(From Our Special Correspondent.)

The total number of shares sold this week was 193,204, exceeding that of last week by some 5,000. The advance in prices has been general, although only a few points have been gained. Few losses have been taken.

Park City favorites score as usual, Daly West going to \$52.25 on sales of 700 and Daly Judge to \$12, on Saturday just before closing with 2,431 shares sold. Wabash, of Park City, the stock that did the swift advance last week, has settled steady around \$2.50, the limits being \$2.70 and \$2.38 with 9,695 shares changing hands. Comstock placed 6,410 shares at prices between \$1.35 and \$1.06, advancing over last week a few points.

Of the Tintic propositions Grand Central headed the list having advanced to \$6.20 per share with sales of 4,368 while some of it went as low as \$5.95. Lower Mammoth remains steady at 85@80c., with sales of 16,300 shares. Mammoth has advanced to \$1.46½ with sales of 1,400 shares. Uncle Sam places 4,000 at 29½@29c.; while Yankee Consolidated goes on down to 50@60c. with sales of 9,600. Eagle & Blue Bell stands steady at \$1.02@1.17 with sales of 1,650 shares. Sunshine, of Mercur has advanced to 23½ with exchanges of 12,500 shares, while Ingot of the same camp placed 11,500 shares at 9¼@8¾, a slight advance over last week.

Majestic of Milford, Beaver County, sold 100 shares at \$3. California placed 45,600 shares at a loss over last week the lot going at 31@25c. Century, of Park Valley, reached \$1.15 with sales of 10,400 shares.

San Francisco. Sept. 6.

(From Our Special Correspondent.)

The market this week was again quiet, with only moderate business, and a slightly lower range of

prices. Consolidated California & Virginia was quoted at \$1.25@1.30; Ophir, \$1.10@1.15; Caledonia, 92@96c.; Hale & Norcross, 22@24c.; Gould & Curry, 12c.; Yellow Jacket, 10c.; Best & Belcher, 7c.

On the Oil Exchange business was still quiet, but somewhat better than last week, while prices were generally firm. Home sold at \$2.80; Central Point Consolidated, 80c.; Sovereign, 24@25c.; Junction, 17c.; Monarch, 15c. The special favorites in the trading were Junction and Sovereign.

London. Aug. 30.

(From Our Special Correspondent.)

The London mining market keeps at a remarkably low ebb. Very few people are in town. In fact, the stagnation of business, due to holiday making, gets greater every year, and even those who have to attend at their offices on routine business have little to occupy themselves with. The African market is in a very depressed condition, owing to a variety of reasons, of which the difficulty of obtaining supplies of labor is the chief. It is gradually being realized that the effects of the war will last longer than was expected. The country is, of course, ruined for some time as an agricultural producer, and the bulk of food supplies have still to be imported. Also the railroads continue to be required by the government to a large extent. It is obvious, therefore, that the prices of everything are as high as ever. The most eloquent evidence of the difficulties encountered is the fact that the monthly output is increasing very slowly, and at present is only 1-3 of the capacity of the producing mines. The probabilities are that many months will elapse before the public take any interest in the African market. Other sections of the mining market are just as dull as they can be, and there is an entire absence of speculation.

English companies operating in British Columbia have figured unfavorably in public lately. This week the Hastings (B. C.) Exploration Syndicate has had to confess that the properties have turned out badly. The company was formed in 1897 to acquire claims in various parts of British Columbia, and the claims near Nelson have been developed extensively. Just as the ore bodies were well opened up and shipment commenced, signs of impoverishment rapidly set in, and it was soon found that the deposit was limited. At the present time there is no payable ore in sight, and further development is not recommended. The company also has interests in coal properties in the Fernie District which are to be sold shortly. No doubt the company will make a satisfactory deal in this case, and this will to some extent recoup it for the other losses.

There has been quite a lull in British Columbians lately, and little is heard of the Whitaker Wright group. A company operating in that province that was floated privately three years ago is the Bosun Mine, Limited, which was formed with a capital of £50,000 by Mr. E. L. Heatley. The mine is at New Denver, in the Slovan District, and at first the returns from the silver-lead ores shipped were very fair and yielded a profit. With the fall in price in silver and lead and the raise in wages the ores are no longer profitable, and Mr. Sandiford, the manager, decided to stop shipping but proceed with development. Since then a vein of zinc blende carrying silver has been struck, and it is sufficiently low in other concomitant ores to make it of shipping value. It is probable, therefore, that the zinc vein will be worked for shipping while the silver-lead waits for an improvement in prices.

The holding of the statutory meeting of shareholders of the reconstructed Smelting Corporation, Limited, has drawn once more the attention of the public to this unfortunate concern. It is now a year ago since the Fry zinc-lead process was found to be of no value, and since then the herculean task of straightening matters out and looking for a new field of operations has occupied the directors and shareholders very closely. The company was reconstructed by the efforts of Mr. John Peters, whose plan is to use the smelting plant for the reduction of copper ores, supplies of which would come from Chile from various mining companies he is interested in. As smelting has been prohibited by the complaint of adjoining landowners at Ellesmereport, it is proposed to ship the plant to Chile and to erect an electrolytic refining plant at Ellesmereport. This is the main proposition, but some of the directors seem to be entangled in the charms of new processes instead of going on the well-established lines of metallurgical practice. A company in this parlous condition is not the one for experimenting on new processes, besides which the directors and their advisers are not skilled copper metallurgists. For my own part, I cannot see how success is to attend a company hampered with share capital and debentures, the legacy of former mismanagement, in want of new capital, and without experienced advice. Of course the reason the shareholders have for going into the reconstruction is simply the off chance of getting something back eventually by making their shares of realizable value on the stock market. It is hardly likely that new people will go in with more money

unless exceedingly liberal terms are offered as sufficient inducement for a gamble.

COAL TRADE REVIEW.

New York. Sept. 12.
ANTHRACITE.

The strike is still on, with little prospect of an immediate settlement. The only encouraging factor in the situation is that those officials of the United Mine Workers who have been keeping the men in line by promises must now be at the end of their resources in this respect. The Civic Federation and Senator Hanna have accomplished nothing, Senators Quay and Penrose have apparently found the situation perplexing, and Carroll D. Wright's report with that of Attorney General Knox removed any prospect of Congress or President Roosevelt taking hasty action. There remains but the Governor of Pennsylvania, and he is not likely to promise much help to Mr. Mitchell. In the meantime the \$500,000 weekly relief fund is not forthcoming, and though the miners can hold out for weeks, yet the great majority of them would undoubtedly be glad of any kind of an excuse for returning to work. There is nothing to indicate that Mr. Morgan or the presidents of the coal companies will make the great blunder of weakening at the eleventh hour. Their attitude now is precisely what it was in May. Meanwhile coal is scarcer, and, though the output of the washeries is larger, a great number of people who ordinarily use anthracite will burn bituminous for domestic purposes this winter.

At the head of the Lakes the docks are bare, and as the producing companies are likely to supply their live trade before shipping to distant points consumers in the Northwest will burn bituminous coal, lignite and wood this winter. In Chicago territory there are no supplies of importance not under contract, and practically no anthracite to be had at wholesale. Retail prices at Chicago are \$11@12; wholesale, about \$10@11. Along the lower lakes and in Canadian territory supplies vary at different points, but are in general very light. The Erie Company is still selling a little coal at Buffalo. Along the Atlantic seaboard there are fair supplies still at some points, but dealers restrict sales and keep prices up. The situation is worst about New York Harbor, where retailers will sell only by half-ton lots and ask \$12@13 per ton. New York dealers, owing to the high price of land, have very small storage yards in proportion to the business they do, and consequently had little coal on hand when the strike came, while the outcry over the use of bituminous in the early days of the strike lead to many manufacturing concerns and office buildings and the elevated railroad buying up the coal available. The elevated is now burning broken, egg and stove in its locomotives, and is getting coal where it can. Consumers at the shoal water ports where ice makes early are likely to find trouble in getting supplies before navigation closes. At Boston the market is quiet, with coal selling at \$10 and dealers cutting down orders. At Narragansett Bay points many dealers have coal enough on hand to last two months or so yet if doled out. At Philadelphia dealers are now practically out of domestic sizes, and the use of bituminous is increasing.

The regular September and winter prices for free-burning white ash coal, f. o. b. New York Harbor ports, are: Broken, \$4; egg, \$4.25; stove and nut, \$4.50. The producing companies will have coal to sell at these figures when the strike is over.

BITUMINOUS.

The Atlantic seaboard bituminous trade is moving pretty smoothly just at present. During the past week or 10 days the railroads have given good car supply and fairly quick transportation, but nobody feels sure that such service will last continuously for any length of time. Poor transportation and car supply during the last week of August advanced speculative prices 75c. to about \$3.75, f. o. b. New York Harbor shipping ports for Clearfield. There have been a few indications of weakness recently on account of the way coal is arriving at tidewater, and if the railroads continue their present service speculative prices will undoubtedly sag; should the service become poor prices may advance.

The labor troubles have practically ended. The New River and Pocahontas men are back at work, with no concessions gained. But few men are now idle in the regions shipping to tidewater.

Trade in the far East shows little inclination to buy speculative coal from a feeling that with good car supply and transportation the amount of coal arriving at tidewater will increase. Producers have generally lived well up to their yearly contracts. Quite a number of such contracts are believed to be closed already, chiefly those less available for shipping, as producers want some leeway, expecting great trouble in getting cars as soon as the anthracite strike ends. The Long Island Sound trade is more active than that of any other territory and is calling for a considerable tonnage. Producers are giving more attention to deliveries. At New York Harbor points

the situation is fairly easy. Consumers in the all-rail trade are calling for more coal than they are receiving. Some are thought to have considerable supplies on hand, while others are on a hand-to-mouth basis.

Transportation from the mines to tidewater is good, coal coming through in a week. Car supply at the mines has been up to nearly 90 per cent of the demand during the week. In the coastwise vessel market small and medium-sized craft are scarce, while large vessels are in good supply. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 60c.; Boston, Salem and Portland, 65c.@70c.; Portsmouth, 70c.; Lynn, 80c.; Newburyport and Saco, 85@90c.; Bath and Gardiner, 75c., with towages to latter port; Bangor, 80c.@85c. Rates from the further lower ports are 10c. higher than above figures.

Birmingham. Sept. 8.

(From Our Special Correspondent.)

Alabama's coal production is strong and there is demand for all the coal produced. Prices are good, with an upward tendency. All the larger mines in the State are in full operation. The transportation companies are able to furnish more cars now, and as a result the miners are being kept busy.

The opening shipments of coal from the new mines of the Sloss-Sheffield Steel and Iron Company in Walker County, from those of the Lehigh Coal Company, in Blount County, and from those of the Davis Creek Coal and Iron Company, in Tuscaloosa County, will be made this month. At all these places the work of preparing the mines for steady operation is being pushed. The general managers of these mines have great anticipations as to the future and are anxiously waiting the first shipment of their product.

W. F. Aldrich, president of the Montevallo Coal and Railway Company mines, is making efforts to place non-union miners in his mines. He refuses to pay the scale adopted by the United Mine Workers and the Alabama Coal Operators' Association.

Chicago. Sept. 9.

(From Our Special Correspondent.)

In general the revised wholesale price-list for bituminous coals, adopted September 1 and applicable to all sales in car-load lots, stands unchanged. There has been an advance in smokeless Pocahontas of 75c. beyond the list, making the new price \$5. This is the only change.

Business is very good, both for city and country. All grades are in demand, high-class smokeless, perhaps, leading. The September advances are being met by the retailers. On the best grades of bituminous the consumer will have to pay 50c. to \$1 a ton more than in summer. Quotations are, for delivery aboard cars, Chicago: Kentucky cannel, \$4.50; Cannelburg cannel, \$3.50; West Virginia splint, \$3.60; Hocking lump, \$3.35; Hocking nut, \$3.05; Youghiogheny lump, \$3.47@3.55; West Virginia lump, \$3.47; Brazil block, \$2.60@2.70; Sterling block, mine run, \$2.55; Indiana semi-block, \$2.10; Royal lump, \$2.10; Buckeye lump, \$1.85; Buckeye run-of-mine, \$1.65; Pocahontas lump and egg, \$5; blacksmith's coal, \$3.50. For Milwaukee Chicago prices prevail generally, except that Kentucky cannel is \$2 a ton higher, or \$6.50. For Duluth the new rates are the same as Chicago on Youghiogheny, Hocking and West Virginia lump; on smokeless lump and egg they are 50c. higher than Chicago. Illinois coals, on cars at mines, are the same as last week: Wilmington, \$1.60@1.90; Carterville, \$1.10@1.55; Muddy Valley, 6-in. lump, \$1.35; DuQuoin lump, \$1@1.30; Springfield, \$1.05@1.30; Mt. Olive, \$1.05@1.30; Centralia, \$1@1.20; Wenona, \$1.60@1.90. At Chicago these prices in Illinois coals are 65c. to \$1 more, the amount of the freight rate.

Cleveland. Sept. 10.

(From Our Special Correspondent.)

The fall movement of coal is just now setting in very briskly, and there is a heavy demand on all sides. The lake movement has been so light all summer that it is now apparent that the shippers will not be able to meet their contracts in the Northwest. Their only aim now is to cut down their shortage as much as possible, and they are besieging the railroads for more cars and engines. The railroads have not responded very generously because they are in no position to do so. The increase in the general merchandise business and also in the other commodities usually shipped by lake is demanding a better supply of cars in those trades, thereby reducing the amount of rolling stock available for the coal trade. The domestic consumers are in but little better predicament, and while none of the concerns is as yet feeling any serious effects from the car shortage they are nevertheless running on a limited supply of coal. The end of the strike in West Virginia makes available a better supply of coal in this territory, since much of that output is brought to the lakes, yet it avails but little unless there is car supply enough to meet the demands of the shippers. All told the fall

starts in with a brisk demand, but without any very bright prospects for that demand being fully met.

Pittsburg. Sept. 10.

(From Our Special Correspondent.)

Coal.—There is a good supply of railroad cars this week, but Monday being a holiday among the foreigners, a number of mines were closed. The transportation facilities are not at all satisfactory, and the refusal of men to work when cars are available is very disappointing to operators. The lake shippers are behind in deliveries despite the fact that several thousand additional miners have been employed in order to increase the production. It was estimated at miners' headquarters to-day that fully 5,000 striking anthracite coal miners have been brought to the Pittsburg District since the strike began, but the demand for coal continues to exceed the supply. Prices are firm, and a stiff premium is asked for all coal not contracted for early in the season. Reports to-day are to the effect that all the mines in the district are in full operation.

Connellsville Coke.—The record-breaking production of coke continues. Shipments were better last week, and more cars, it is said, are being furnished this week. Prices are unchanged, but large premiums continue to be paid for prompt delivery. It is reported that contracts have been made for furnace coke for next years' delivery at \$2.75 a ton. The contract price for this year has remained at \$2.25@2.50 a ton. The Courier in its last issue gives the production for the week in the Connellsville field at 254,853 tons, a gain over the previous week of a little over 100 tons. The shipments for the week aggregated 11,670 cars, distributed as follows: To Pittsburg and river tipples, 3,960 cars; to points west of Pittsburg, 5,586 cars; to points east of Connellsville, 2,124 cars. This was an increase of 319 cars compared with the shipments of the previous week.

San Francisco. Sept. 6.

(Special Report of J. W. Harrison.)

Since the Sierra sailed, the only arrival has been the Port Crawford with 2,500 tons of coal. This arrival of but one ship from Australia within the past 30 days, is very exceptional. In the preceding 30 days we had eight arrivals from the Colonies, with a total of 20,169 tons. If the sharp demand existed now that existed a year or two ago, the mere matter of a single cargo within a month's time, would have created a marked advance in local Australian coal. As it is now, no difference seems to exist from the fact of there being a single arrival in 30 days. There are several vessels to-day fully due from Newcastle, N. S. W., which will probably arrive here, all within the next 15 days. There are at present on the engaged list 17 vessels, aggregating about 50,000 tons capacity. This is all that can possibly arrive here prior to December 1, hence the market will not be affected by generous arrivals from Australia. Freight rates are reported firm, and the number of vessels offering is limited, hence Australian shipments should come to a covering market. Fuel oil continues the disturbing element, forcing coal prices down to such limits, that little profit if any, is left to the coal shipper. Forceful endeavors are being made to convert the Philippine transports into oil consumers, but the outlook is that no change will be made, the conversion being too costly.

Prices.—Our special correspondent reports prices for Coast coals to dealers as follows: Wellington and Southfield, \$8; Roslyn, \$7; Seattle and Bryant, \$6.50; Coos Bay, \$5.50; White Ash, \$5. For Rocky Mountain coals, large lots, quotations are: Castle Gate, Clear Creek, Rock Springs or Sunnyside, \$8.50; Colorado anthracite, \$14. For Eastern and foreign coals, cargo lots, prices are: Pennsylvania anthracite, \$14; Cumberland, \$12; Welsh anthracite, \$13; cannel, \$11.50; Brymbo, \$7.50; Wallsend, \$7.

Foreign Coal Trade. Sept. 4.

Nothing new is to be reported concerning the export trade here. The usual shipments to the West Indies and South America are being made, with some to Mediterranean ports; but there is little or no surplus at seaboard ports for export.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of August 30, that large coals remain very firm, but smalls show signs of weakening. Stems are still very full. Quotations are: Best Welsh steam coal, \$3.96@4.02; seconds, \$3.84; thirds, \$3.66; dry coals, \$3.66; best Monmouthshire, \$3.42@3.48; seconds, \$3.24; best small steam coal, \$2.04; seconds, \$1.56; other sorts, \$1.50.

The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½ per cent discount.

The freight market continues in a depressed condition, the Mediterranean, however, showing slight signs of advance. Some rates quoted from Cardiff are: Marseilles, \$1.10; Genoa, \$1.08; Naples, \$1.08;

Singapore, \$3.72; Las Palmas, \$1.38; St. Vincent, \$1.56; Rio Janeiro, \$3.00; Santos, \$3.24; Buenos Aires, \$3.24.

IRON TRADE REVIEW.

NEW YORK, Sept. 11.

The comparative quiet in the iron market continues, chiefly because the pressure for early deliveries is less. The coke shortage at furnaces, owing to railroad delays, is an annoying feature of the situation, and has reduced production. Pig iron makers are generally behind on deliveries, and will hardly be able to catch up before March or April next.

Import business continues active, and much British and German material is being sold along the seaboard. German iron and steel are being offered in Pittsburg. It is also stated that a contract for 35,000 tons of steel rails, to be delivered at Galveston, Tex., has been taken by a German company.

It is announced that Rogers, Brown & Co. have contracted to take for 6 months all the iron made by the Dominion Iron and Steel Company in excess of the quantity which the company needs for its steel plant. This purchase will cover about 7,000 tons a month.

As an example of the condition of the Southern iron trade the statement of the Sloss-Sheffield Steel and Iron Company for the quarter ending August 31 may be taken. This shows net profits of \$311,969, after deducting \$35,199 for extraordinary repairs and renewals. Fixed charges and 1 1/4 per cent dividend on the preferred stock amounted to \$174,000, leaving a surplus of \$137,969. The surplus on June 1 was \$710,665, which the quarters' profits increased to \$848,634. It is to be remembered that a large part of the iron made during the quarter was delivered under old contracts, and that the full effect of present prices will hardly be felt until the last quarter of the year.

Birmingham. Sept. 3.

(From Our Special Correspondent.)

Spot iron is very scarce and demanding a big price. It has sold as high as \$25 per ton already in this district. The larger manufacturers of pig iron in the Southern producing territory are protecting their regular customers who buy in small lots, charging from \$2 to \$4 less than spot iron is quoted.

Some of the companies in the State are out of the market, even on 1903 iron. The Sloss-Sheffield Steel and Iron Company, with the exception of a little spot iron and some small lots to foundries hereabouts, has sold no iron in the open market since August 9, and for some little time it is likely that company will remain out of the market. The Tennessee Coal, Iron and Railroad Company is said to be still selling for delivery after March, 1903, while other companies in the district are in the market for some orders.

The production in Alabama has been improved by the blowing in of No. 3 furnace of the Sloss-Sheffield Company at North Birmingham. This furnace begins making iron to-morrow and will turn out about 5,000 tons of iron per month. The Woodstock Iron Company at Anniston has another furnace ready for the torch. The small charcoal furnace at Round Mountain, Ala., will be repaired and started up within the next three months. It is announced that the Tennessee Company will start up one of the Oxmoor furnaces in the next three months, while one of its furnaces at Ensley will also be made ready. By the middle of October the 75-ton furnace of the Williamson Iron Company, in this city, will be ready for operation also. By January 1, 1903, the Alabama Consolidated Coal and Iron Company expects to have its large new furnace at Gadsden in operation.

The following are the quotations: No. 1 foundry, \$19; No. 2 foundry, \$17.50@18; No. 3 foundry, \$16.50@17; No. 4 foundry, \$15.50@16; gray forge, \$15; No. 1 soft, 19; No. 2 soft, \$17.50@18.

Activity is still noted in the finished iron and steel circles. Plenty of work is being done in the rolling mills and at the steel plant. The demand for both steel and finished iron and steel is good and the prices being obtained for these products most satisfactory. The cast iron pipe manufacturers are doing a good business with fair prospects for a continuation. This means more business for the furnaces.

Chicago. Sept. 9.

(From Our Special Correspondent.)

Scarcity of coke threatens to close all foundries and furnaces in the Chicago District for an indefinite time. Already foundry coke is above \$8; sales have been made all the way from \$8 to \$15. The greater part of the available supply will probably be sold out in two weeks, unless an entire change takes place in the hard coal situation. It is safe to say that after this week coke will not be obtainable at less than \$10 @ \$11 without an end of the strike. Yesterday the Iroquois Iron Company shut down one of its South Chicago stocks; other closures on the part of furnaces are reported from neighboring cities. Foundries are also closing.

On account of these conditions sales of pig iron have been comparatively light in the last week. The rising tendency in prices has also been checked. Quotations are as follows:

No. 1 Northern, \$23.50@24; No. 2 Northern, \$23 @23.50; No. 3 Northern, \$22.50@23. On Southern the rate from Birmingham to Chicago was advanced 50c. on September 4, being now \$4.15. Most sales of Southern are probably being made at \$18@20, Birmingham, or \$22.15@24.15, Chicago; these prices being for No. 2, with No. 1 the customary 50c. more and No. 3 the customary 50c. less than No. 2.

The above prices are all on the basis of delivery after May 1 next, to which date practically everything is now sold out, both in Northern and Southern iron. Delivery before that date means a premium of \$3 to \$5, depending on time. Hardly any sales are being made for delivery in less than 30 days; "spot" is now understood to mean anything less than 60 days' delivery.

Chance lots of Lake Superior charcoal iron continue to bring \$28, when obtainable.

Cleveland. Sept. 10.

(From Our Special Correspondent.)

Iron Ore.—It is now apparent that the stock piles of ore at the head of the lakes have about been exhausted, and the movement henceforth must be from the mines direct, making the vessel interests dependent upon the car supply for dispatch in loading; a situation that is not very satisfactory since cars are scarce. The shippers have tried without success during the last week to reduce the rate of carriage out of Escanaba, and in consequence rates remain 75c. from Duluth; 65c. from Marquette and 60c. from Escanaba.

Pig Iron.—The curtailment of pig iron production continues, and has been so severe that foundries in this territory are shutting down, and agricultural works are being compelled to postpone their usual fall activity. The coke shortage is responsible for this condition, and the car shortage is responsible for the coke supply. Iron for spot delivery is out of the question, and even the quotation of \$25 for No. 2 at the furnace is nominal. A few basic furnaces are resuming activity, and are making off-iron, which is selling at \$20.50 freely. Basic for the future is out of the question for this year's delivery, and no sales are made for the second quarter of next year because of the present uncertainty as to price. The bessemer producers are not talking prices, and are making no sales either for spot or future delivery.

Finished Material.—Steel plate has been sold up for the first half of next year by all of the big producers. The larger mills offer no plates for sale before January 1, and the smaller mills which have any are asking fancy prices, ranging about 2.50c. Sheets are beginning to show new strength, and the demand is about equal to the supply, the fall trade having been started. Black sheets are selling at 3.10@3.20c. at the mill or 3.35@3.50c. out of stock for No. 27 as a basis. Galvanized sheets are selling at 4.50c., but are not in large demand. Structural steel mills are still taking orders for delivery first half of next year, but the supply is becoming limited. The larger dealers, who are doing all of the business, are getting 1.60c. Pittsburg. Smaller dealers and jobbers are asking 2.50@3c. for spot delivery, and are inclined to ask the same price for future delivery. Bars are in better demand, and the supply is about sold up for this year, with some of next year's capacity also contracted. Bar steel prices range as they have been at 1.60c. Pittsburg, for bessemer and 1.70c., Pittsburg, for open-hearth. The smaller sizes are plentiful, but the larger rounds are hard to obtain. Bar iron is now sold almost universally at 1.80c. Pittsburg. Billets are not on the market in any large quantities, and those who would have them to sell are preferring to place bars as being more profitable to the producers since billets are bringing only \$30 gross Cleveland.

Duluth Sept. 8.

(From Our Special Correspondent.)

Iron ore shipments for the month of August were very large from Minnesota, amounting to 2,398,000 gross tons, as follows: Duluth, Missabe & Northern, 947,698 tons; Duluth & Iron Range, 800,116; Great Northern, 649,707. For the season to date and in past years the following is the showing:

Year.	Season to September.	Month of August.
1902.....	9,719,600	2,398,000
1901.....	6,620,600	1,852,000
1900.....	6,306,000	1,474,000
1899.....	4,885,000	1,457,000

The largest shipments to date from the Mesabi Range have been made from the Fayal Mine and the Adams-Spruce, which latter are to be considered as one mine for all purposes of management and statistics. The Fayal shipped to September 1 a total of 1,150,000 gross tons, partly from the shafts and partly from the steam shovel and milling pits. Its estimated total for the full year is a little more than 1,600,000 tons and it will have no difficulty in making that

amount. The Adams-Spruce has shipped to September 1, a total of 1,200,000 tons, all from underground, six shafts being in operation. The estimated annual total for this property is about the same as Fayal, and it will have no trouble in filling it. The Fayal ships over the Duluth and Iron Range road to Two Harbors and the other over the Duluth, Missabe & Northern to Duluth. Both are at Eveleth and are adjoining properties, and both belong to the mining department of the United States Steel Corporation.

Philadelphia. Sept. 11.

(From Our Special Correspondent.)

Pig Iron.—A good many of our consumers of foundry iron feel much easier this week than they did a week or two ago, having arranged for not only early deliveries but in a number of cases for later deliveries for material from abroad. The apprehension of higher prices has lost its force in a measure. Scotch iron is quoted to-day at \$23; Middleboro, \$21. These figures are satisfactory, and the only anxiety is to get contracts placed and deliveries fixed.

Muck Bars.—Business has been done within 48 hours at an advance of 50c. per ton, but the material is wanted right away.

Bar Iron.—An easier condition prevails. Bars are quoted at 1.90@2c. in large lots. Some Western steel bars are coming in.

Skelp Iron.—The situation is not quite so strained as a month ago, and while all mills have work on hand they are better able to keep up with their customers' requirements.

Merchant Steel.—There is no change in quotations, and all agents report a strong market, an increase in consumption and a belief that current prices will rule to the close of the year.

Plates.—The only feature this week is that there are more small buyers of plates getting fixed up than last week. There are quite a number of orders going to mills this week, most of them for our local territory.

Structural Material.—The same remarks apply to the structural material market. Eastern Pennsylvania will soon have additional capacity; and from various sources it is evident that the American Bridge Company will place a large amount of business in Eastern Pennsylvania mills before the close of this month.

Oil Rails.—Old steel rails have sold as high as \$22 and old iron rails at \$25; there are more inquiries than sellers.

Scrap.—The urgency for heavy steel scrap is greater and there is nothing in sight. Whatever is picked up is captured in advance.

Pittsburg. Sept. 10.

(From Our Special Correspondent.)

There has been an improvement in transportation as promised the furnacemen by the railroads. It had been agreed to give coke the right of way from the Connellsville region to the Valleys, and there was a gain in shipments late last week, and all furnaces except the Hazleton in the valleys are now in operation, though but few are being operated to their full capacity. Not more than two-thirds of the normal capacity of the furnaces was produced last week, but a much better record will be made this week. Hazleton Furnace of the Republic Iron and Steel Company was banked so long that it chilled and was seriously damaged as a result. The Valley furnaces are all out of the market for the rest of the year, and all the iron available, but at fancy prices, is in the hands of the middlemen. Owing to the difficulties in securing coke the furnaces will not be able to fill all contracts, and a large tonnage will go over into next year. It does not now seem possible for the furnaces to catch up before April or May. It is reported that the United States Steel Corporation has contracted for 50,000 tons of German pig iron, said to be almost equal to the bessemer grade of the Valley furnaces at \$21.50, and that deliveries will begin soon after October 1. Gray forge and foundry iron are quiet, but prices are firm.

Foreign steel is lower, and negotiations are pending that are likely to result in the placing of some large orders. A representative of large German interests is in Pittsburg, and offers basic bessemer sheet bars at \$29.80 delivered in this market. He holds basic open-hearth sheet bars at \$30.60, Pittsburg, and will contract to furnish them sheared. It is believed on a firm offer these prices would be shaded. No important sales have been closed. The domestic steel market is quiet, but there is an increased demand for sheet bars. The United States Steel Corporation is sold up to next May on plates, and has taken no premiums above the pool price of 1.60c. Orders are still being accepted at that price, but delivery is not promised until after May 1. All other producing concerns are getting premiums for this year's deliveries. Orders for steel rails continue to be placed, and it is

estimated that nearly 1,500,000 tons have been contracted for, or one-half of the probable production of 1903. There were 2,836,273 tons of steel rails made last year, and the production this year likely will not exceed that amount, as the Lackawanna Iron and Steel Company has not rolled any rails, but expects to have its new plant in operation before the close of the year. Fully 300,000 tons, and probably more, contracted for delivery this year will go over into 1903.

The demand for bar iron continues in excess of the supply, and this week the minimum price was officially advanced \$1 a ton, making the rate 1.85c., f. o. b. Pittsburg. Bar iron has not been quoted at less than 1.80c. for nearly three months, and some mills are holding the price at 2c. The wages of the skilled workmen in the union rolling mills of the country are regulated by the selling price of bar iron under the scale of the Amalgamated Association of Iron, Steel and Tin Workers. The bi-monthly adjustment scheduled for to-morrow may not be held until next week, owing to the absence in the South of James H. Nutt, secretary of the Labor Bureau of the Republic Iron and Steel Company, who submits the sales sheets of the company to the Amalgamated Association representatives for examination. The puddlers and finishers expect an increase, as the wage rate established two months ago was based on bar iron at 1.60c.

Pig Iron.—A sale of pig iron of a special grade was made this week at \$22.50, Valley furnaces. Bessemer has sold up to \$22, and \$21.50, Valley, is asked for delivery next year. While the buying of foundry iron is not particularly heavy prices are firm. A sale of 500 tons of No. 2 for delivery in the fourth quarter at \$24, Pittsburg, is noted this week. Another sale was made calling for 2,000 tons of No. 2 grade for delivery in the first half of next year. The price is \$22.50, Pittsburg. German foundry iron of No. 2 grade is offered delivered in Pittsburg at \$22.50 for this year and 50c. less for 1903. Gray forge is not active, but prices are firm at \$21.25@21.75, Pittsburg, irrespective of delivery.

Steel.—While there has been increased buying of finished material, prospective buyers are evidently holding off until the situation clears up. There is not likely to be great activity until the end of the month. Bessemer billets are held at \$31, and sheet bars at \$32. There is a better demand for sheet bars for galvanizing.

Sheets.—The sheet market is quiet, but a little firmer. No. 28 gauge is still quoted at 3c. Galvanized sheets are 75 per cent off in car-load lots to jobbers, and some large lots have sold at 75 and 5 per cent off.

Ferro-manganese.—The price of the foreign product has advanced \$1 a ton to \$52.50@54. The domestic producer is still out of the market.

New York. Sept. 12.

Pig Iron.—With many furnaces sold up to next July the market is very firm, and transactions in American irons are light. Sales of imported irons are larger. Rogers, Brown & Co. have contracted for the foundry iron produced by the Dominion Iron and Steel Company, of Sydney, N. S., for 6 months. We quote for 1903 delivery, Northern irons at tidewater: No. 1X foundry, \$23@25; No. 2X, \$22@23; No. 2 plain, \$21@22. For Southern iron on dock, New York, No. 1 foundry, \$22@23; No. 2, \$21.75@22.25; No. 3, \$21@21.50. Middlesboro pig is quoted at \$19.50.

Bar Iron and Steel.—Demand is good. We quote large lots on dock: Refined bars, 1.95c.@2.05c.; common, 1.85c.@1.90c.; soft steel bars, 2c.@2.10c.

Plates.—The market is still with the mills not seeking orders. We quote for tidewater delivery in car-loads: Tank, 1/4-in. and heavier, 2.05@2.30c.; flange, 2.15@2.40c.; marine, 2.25@2.50c.; universal, 2.05@2.25c.

Steel Rails.—The prospects for a heavy demand in 1903 are good, judging from the inquiries coming in. Standard sections are quoted at \$28, f. o. b. mills for 1903 delivery; light rails, \$30@35, according to weight.

Structural Material.—The market continues very strong, with every prospect of a good demand well into 1903. Premiums are still paid for small lots and prompt deliveries. We quote for forward delivery at tidewater as follows: Beams and channels, 2@2.30c. tees, 2@2.25c.; angles, 2@2.25c.

Nails.—Business is fairly good. We quote for large lots on dock: Wire nails, \$2.20; cut nails, \$2.18.

Cartagena, Spain. Aug. 23.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—Since our last report 3 cargoes dry ores, 8,000 tons in all, have been shipped, making a total of 225,480 tons to date. During the week no variation in the market has taken

place worth mentioning. Production keeps active and ores are in good demand. Steamers are scarce and rates of freight higher than they were.

Quotations are per ton, f. o. b. shipping port: Ordinary 50 per cent iron ore, 6s. 6d.@6s. 9d.; special low phosphorus ore, 50 per cent iron, 7s.@7s. 6d.; special ore, 50 per cent iron, 3 per cent manganese, 6 per cent silicon, 8s. 6d.; specular ore, 58 per cent iron, 9s.; magnetic ore, 60 per cent iron, 5 per cent silicon, 11s. 6d. for lumps and 9s. 6d. for smalls. For manganiferous ores quotations are: No. 1, 20 per cent iron and 20 per cent manganese, 14s. 3d.; No. 1 B, 25 iron and 17 manganese, 11s. 3d.; No. 2, 30 iron and 15 manganese, 10s. 3d.; No. 3, 35 iron and 12 manganese, 9s. 6d. All grades of manganiferous ores are rated at 11 per cent silicon and under 0.03 phosphorus.

Iron Pyrites.—Pyrites, 40 per cent iron and 43 per cent sulphur are quoted at 11s. per ton, f. o. b. shipping port. Exports for the week were 500 tons to Swansea, Wales. There were also 25,300 kgs. ocher shipped to Swansea.

CHEMICALS AND MINERALS.

(See also wholesale prices-current on page 366.)

New York. Sept. 11.

Sellers generally are realizing good prices, and consumption is growing, especially for the commercial chemicals. Raw materials, such as brimstone and nitrate of soda, continue strong, as the combinations are adhering to the policy of high prices when the buying season is on. Manufactured goods are sympathetically firm.

Heavy Chemicals.—Contracts show larger shipments of alkali and caustic soda, as the glass plants are ready to resume work. Some 1903 business in these chemicals is reported at quotations below. Competition is keen between domestic makers of bleaching powder and the sellers of the foreign article. One result of this is a reduction in prices for next year's delivery. All sorts of prices for bleach are heard, and in several instances quotations for forward shipments have been materially less than present prices. Generally \$1.25@1.50 is quoted for 1902 delivery. There is no doubt that American manufacturers are increasing their production at a rate that must alarm foreigners. Already the works in the Middle West are producing good quantities of marketable bleaching powder, to say nothing about the eastern works, whose supply is well under contract. The consumption of bleach in this country has grown considerably, being between 75,000 and 80,000 tons annually.

Domestic chemicals, we quote, per 100 lbs., f. o. b. works, as follows: High-test alkali, in bags, 82 1/2c.@87 1/2c., for prompt shipment, and 77 1/2c.@85c. for forward; caustic soda, high-test, \$1.90@1.95 for early delivery, and \$1.85@1.87 1/2 for futures; bicarb. soda, ordinary, \$1, and extra, \$3; sal soda, 65c.; chlorate of potash crystals, \$7.75. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90c.@92 1/2c.; caustic soda, high-test, \$2.25; sal soda, 67 1/2c.@74c.; bicarb. soda, \$1.50@1.60; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.60@1.65.

Acids.—Some improvement is noticeable, though oxalic acid, in the absence of definite action on next year's prices, has weakened. Blue vitriol also shows more interest.

Quotations per 100 lbs. are as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars) delivered in New York and vicinity:

Blue vitriol ... \$4.60@5.00	Oxalic, com'l... \$4.50@5.00
Muriatic, 18 deg. 1.50	Sulphuric, 50 deg., bulk, ton ... 13.50@15.50
Muriatic, 20 deg. 1.62 1/2	Sulphuric, 60 deg. 1.05
Muriatic, 22 deg. 1.75	Sulphuric, 60 deg. bulk ... 18.00@20.00
Nitric, 36 deg. 4.00	Sulphuric, 66 deg. 1.20
Nitric, 38 deg. 4.25	Sulphuric, 66 deg. bulk ... 21.00@23.00
Nitric, 40 deg. 4.50	
Nitric, 42 deg. 4.87 1/2	

Brimstone.—Arrivals at New York this week were 4,800 tons. Sales ex-steamer are noted at \$23.00@23.50 per ton for best unmixed seconds, while shipments hold at \$22.25@22.50, and thirds, \$1.50 less. A revival in business is looked for.

Zinc Dust.—The demand from cyanide works has greatly improved. Messrs. Fuerst Bros. & Co., of New York, are offering a superior article, which they are importing and claim to be almost free from lead. Quotations vary, from \$4.50@5 per 100 lbs., f. o. b. New York, according to seller.

Pyrites.—Spanish iron pyrites are in good request at satisfactory prices. Domestic pyrites are also moving in a good way at unchanged prices.

Quotations are f. o. b. Mineral City, Va.: Lump ore, \$5 per ton, and fines 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 13@15 1/2c. per unit, New York and other Atlantic ports. Spanish pyrites contain 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—The market is stronger.

Spot gas liquor is quoted at \$3.10 per 100 lbs., and shipments, \$3.02 1/2@3.05. The heavy consumption of late is now telling on stocks, which are not large, either in Great Britain or here.

Nitrate of Soda.—The market is generally firmer, and importers are not anxious to sell, expecting higher prices later on. However, business continues quiet. Spot sales are based on \$1.90 per 100 lbs., which is also quoted for shipments to April next, while May to December, 1903, arrivals are rated at \$1.82 1/2@1.85. The high price on the coast is due to a curtailed production. At present it looks as if the annual output will be not near the quantity fixed by the combination. Consequently, sellers anticipate higher prices. The European market is steady. Ocean freight rates are firmer, but they are still 8s. or 9s. less than this time last year.

Messrs. Mortimer & Wisner in their monthly statement of nitrate of soda, dated New York, Sept. 1, give the following statistics:

	1902. Bags.	1901. Bags.	1900. Bags.
Imported into Atlantic ports from West Coast South America... from Jan. 1, 1902, to date...	698,747	947,236	717,826
From Europe .....	.....	.....	2,063
	698,747	947,236	719,889
Stock in store and afloat Sept. 1, 1902, in New York.....	14,897	72,808	9,498
Boston .....	.....	.....	.....
Philadelphia .....	.....	.....	.....
Baltimore .....	.....	44,540	1,000
Norfolk, Va. ....	.....	.....	.....
Charleston .....	.....	.....	.....
Savannah .....	.....	.....	.....
To arrive, due Dec. 15, 1902....	510,000	413,098	524,000
Visible supply to Dec. 15, 1902..	524,897	528,046	534,498
Stock on hand Jan. 1, 1902....	77,517	13,446	9,586
Deliveries past month	99,635	122,303	166,855
Deliveries since Jan. 1 to date..	761,367	846,334	719,977
Total yearly deliveries.....	1,308,820	1,308,820	1,176,051
Prices current, Sept. 1.....	1.87 1/2c.	1.92 1/2c.	1.72 1/2c.

Phosphates.—Comparatively few new orders have been booked for export, but the shipments this month promise to be large. In August no high-grade Florida rock was exported from Savannah, which is unprecedented. However, the exports from this port in the 7 months ending July 31 were 92,670 tons, or 7,402 tons more than last year.

Reports from the Florida phosphate regions deplore the scarcity of water to operate the mines, especially in Polk County. In some instances work had to be suspended, and in others only half time is possible.

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (78@80%)..	\$6.50@7.00	6 1/4@6 1/2d.	\$9.68@9.88
*Fla. land pb. (88@73%)..	3.00@3.25	4 1/2@5d.	6.65@7.00
*Tenn., (78@82%) export..	3.25@3.50	5 1/4@6d.	5.58@5.96
†Tenn., 78% domestic.....	3.00	.....	.....
†Tenn., 75% domestic.....	2.75@3.00	.....	.....
†Tenn., 73@74% domestic..	2.40	.....	.....
†Tenn., 70@72% domestic..	2.10@2.25	.....	.....
‡So. Car. land rock.....	5.25	4 1/2@5d.	5.67@5.90
‡So. Car. river rock.....	2.75@3.00	.....	.....
Algerian (63@68%).....	.....	5 1/2@6 1/4d.	7.15@7.18
Algerian (58@63%).....	.....	5@5 1/2d.	6.00@6.30
Algerian (53@58%).....	.....	4 1/2@5d.	5.32@5.53

*Fernandina, Brunswick or Savannah.
†Mt. Pleasant. ‡On vessels, Ashley River.

Liverpool. Sept. 3.

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

There is a moderate business passing in heavy chemicals for prompt delivery and prices are steady, but the interest is chiefly centered on the fight now being waged over bleaching powder contracts for 1903 delivery. Soda ash nearest spot prices for tierces are as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d. per ton net cash; ammonia ash, 48 per cent, £4 5s.@£4 10s.; 58 per cent, £4 10s.@£4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are generally quoted at £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda prices are well maintained. We quote: 60 per cent, £8, 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder is quite neglected, while spot quotations are nominally unchanged at £6 12s 6d.@£6 15s per ton, net cash for hardwood packages; with special quotations for the Continent and a few other export quarters. Makers still decline to quote for 1903 delivery, but want bids, and business is reported to have been done at very low figures.

Chlorate of potash is firm at 3d. per lb. net cash, makers being well sold at present.

Bicarb. soda is selling at £6 15s. per ton, less 2 1/2 per cent for the finest quality in 1 cwt. kgs., with usual allowances for larger packages, also special quotations for a few favored markets.

Sulphate of ammonia continues in request for immediate delivery and the market is rather firmer at £12 10s. per ton, less 2 1/2 per cent for good gray 24 @25 per cent in double bags f. o. b. here.

Nitrate of soda is in limited request on spot at £8 15s. @£8 17s. 6d. per ton, less 2½ per cent for double bags f. o. b. here.

METAL MARKET.

New York, Sept. 11. GOLD AND SILVER.

Gold and Silver Exports and Imports. At all United States Ports in July and Year.

Table with columns for Metal, 1901, 1902, 1901, Year, 1902. Rows include Gold Exports, Gold Imports, Silver Exports, Silver Imports, and Excess.

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

Gold and Silver Exports and Imports, New York.

For the week ending September 11, and for years from January 1:

Table with columns for Period, Gold Exports, Gold Imports, Silver Exports, Silver Imports, Total Excess Exports or Imports.

Imports and exports of gold were in small parcels from various ports. Imports of silver were from Mexico and the West Indies; exports were chiefly to London.

Financial Notes of the Week.

General business continues good, and the close of the holiday season is beginning to be felt. The withdrawal of money from New York is plainly shown this week in the contraction of loans and the reduction of bank surplus.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending September 6, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

Table with columns for 1900, 1901, 1902. Rows include Loans and discounts, Deposits, Circulation, Specie, Legal tenders, Total reserve, Legal requirements, Balance, surplus.

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

Table with columns for 1901, 1902. Rows include N. Y. Ass'd, England, France, Germany, Spain, Netherlands, Belgium, Italy, Russia.

The return of the Associated Banks of New York are of date September 6 and the others September 4, as reported by the Commercial and Financial Chronicle cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

This week the silver market continues dull and without special feature. India seems to be buying very little silver, the purchases being chiefly for the Straits.

The United States Assay Office in New York reports receipts of 56,000 oz. silver for the week.

Indian exchange continues strong, in view of better crop conditions there. The Council bills offered in London were taken at an average of 15.94d. per rupee. The buying of silver for India has been very light.

Shipments of silver from London to the East for the year up to August 28 are reported by Messrs. Pixley & Abell's circular as follows:

Table with columns for 1901, 1902, Changes. Rows include India, China, The Straits, Totals.

Receipts for the week were £80,000 from the United States, £9,000 from the West Indies, £5,000 from Chile, £1,000 from the River Plate, and £19,000 from Australia; total, £114,000, all bar silver.

Prices of Foreign Coins.

Table with columns for Bid, Asked. Rows include Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twenty marks, Spanish 25 pesetas.

OTHER METALS.

Daily Prices of Metals in New York.

Table with columns for Silver, Copper, Spelter. Rows include September, Sterling E. change, N. Y. Cts., London Pence, Lake Cts. per lb., Electrolytic per lb., London per ton, Lead, N. Y. cts., St. L. cts.

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

Through a clerical error the New York quotation for silver on September 2 was given in our last issue at 52¼c. It should have been 52½c. per ounce.

Copper has improved considerably. For some time past the market has been depressed, owing to the uncertainty as to the statistical position of the metal, due to the conflicting opinions that were put forward by different parties. The statistics that were recently issued shed considerable light upon this question, and showed that the accumulations of the beginning of the year had been absorbed and that the present stock was normal.

The London market has improved over £1. It closed last Friday at £52 7s. 6d. for spot, £52 15s. for three months, and opened about £1 higher on Monday. It went up to £53 17s. 6d. on Tuesday, but the improvement was lost on Wednesday, and the market closed on Thursday at £53 12s. 6d. for spot, £54 for three months.

Refined and manufactured sorts, we quote: English tough, £56@£56 10s.; best selected £56@£56 10s.; strong sheets, £69; India sheets, £67 10s.; yellow metal, 6½d.

Exports from Atlantic ports in the week ending September 10 are reported by our special correspondents as follows: Great Britain, 743 tons; Holland, 747; Germany, 820; Belgium, 257; Russia, 53; Australia, 1; Brazil, 3; total, 2,624 tons. Imports were 141 tons, principally from Great Britain.

The imports of foreign copper into Germany and the re-exports of such material for the seven months ending July 31 are reported as below, in metric tons:

Table with columns for 1901, 1902, Changes. Rows include Imports, Re-exports, Balance.

This shows an increase of 26.5 per cent in the approximate consumption of foreign stocks this year.

Chilean Copper Market.—Messrs. Jackson Brothers write from Valparaiso, Chile, under date of August 1 that sales of bar copper for the second half of July were 15,496 qtls., at an average of \$32.90@33.05. Chilean currency, per Spanish quintal; equal to an average of 10.4c. per lb. Sales of matte were 350 tons at prices ranging from \$14.09 to \$14.38, Chilean, per Spanish quintal, for 50 per cent matte, f. o. b. shipping port. No sales of ore are reported.

Tin.—The market has been very dull, and business has been of a retail character. We quote September delivery at 27c., October at 26¾c.

The London market closed last Friday at £123 7s. 6d. for spot, £119 5s. for three months. On Monday it ruled at £123 2s. 6d. for spot, £117 15s. for three months. On Tuesday, three months was £1 higher,

and on Wednesday spot went up to £124, 3 months to £119 5s. On Thursday the market closed at £124 10s. for spot, £119 15s. for 3 months.

Lead.—The market continues active at last prices, 4.00c.@4.05c. St. Louis, 4.05c.@4.10c. New York.

The foreign market has declined somewhat, Spanish lead being quoted at £10 16s. 3d.@£10 18s. 9d., English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is firm and in fairly good demand. Missouri brands sell at 4.02½c.; argentiferous lead at 4.05c.

Spanish Lead Market.—Messrs. Barrington & Holt, of Cartagena, Spain, write us under date of August 23 as follows: The price of silver during the week has been 13.25 reales per oz. The exchange has gone up by 6 centimos making it 34.47 pesetas to £1. The local quotation for pig lead on wharf has been 61.25 reales pere qtl., which on above exchange is equal to £9 17s. 6d. per ton of 2,240 lbs. f. o. b. Cartagena. Exports of pig lead have been 338,031 kgs. to Marseilles; 100,000 kgs. to London. Other exports have been 10,000 kgs. lead ore to London.

Spelter.—The market is quiet, but firm. Prices remain unchanged, and we quote 5¼c. St. Louis, 5½c. New York.

The foreign market is unchanged, good ordinaries being quoted at £19 7s. 6d., specials 5s. higher.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter remains quiet but rather firm. Latest sales are on the basis of 5.15c. for prompt and near-by delivery.

Silesian Spelter Market.—Herr Paul Speier writes from Breslau under date of August 28 that prices have shown an improvement in the latter part of the month. The quotations at the close of August are 19@19.25 marks per 50 kgs., f. o. b. cars at Breslau. This is equal to 4.13c. per pound. The average price per ton for the second quarter of the year shows an increase of 25 marks over the second quarter of 1901, but a decrease of 59 marks from 1900. Imports and exports in Germany for the seven months ending July 31 were as follows, in metric tons:

Table with columns for Imports, Exports. Rows include Spelter, Zinc sheets, Scrap zinc, Zinc white, Lithopone, Zinc ore.

The heaviest exports this year were 40,322 tons to Great Britain, 13,479 tons to Austria-Hungary, 9,310 tons to Russia and 3,721 tons to France.

Antimony.—We quote Cookson's at 9¼c.; Hallett's at 8c.; Hungarian, Italian, Japanese and United States Star, at 7¼c.

Nickel.—The price is now quoted by leading producers at 40@47c. per lb. for large quantities down to ton lots, according to size and terms of order. The price for smaller lots, according to quality, runs as high as 60c. per lb.

Platinum.—Consumption continues good, and prices are firm. Ingot platinum in large lots brings \$19 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 73½c. per gram.

Quicksilver.—The New York price continues \$48 per flask for large orders, with a slightly higher figure for small lots. In San Francisco prices are steady, and the quotations are \$45.50@46.50 per flask for domestic orders. For export orders \$44 per flask is quoted. The London price remains £8 15s. per flask, with the same figure quoted from second hands.

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

Table with columns for Per lb. Rows include Aluminum, Ferro-Tungsten, Magnesium, Manganese, Alum-bronze, Mangan' Cop., Molybdenum, Chromium, Copper, Ferro-Molyb'dum, Ferro-Titanium.

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

Average Prices of Metals per lb., New York.

Table with columns for Month, Tin, Copper, Spelter. Rows include January, February, March, April, May, June, July, August, September, October, November, December, Year.

Average Prices of Copper.

Table with columns for Month, New York (Electrolytic, Lake, London Standard), and prices for various months from January to December.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper.

Average Prices of Silver, per ounce Troy.

Table with columns for Month, London, N.Y., and prices for various months from January to December.

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

DIVIDENDS.

Table with columns for Name of Company, Date, Share, Total, and Total to Date, listing various companies and their dividend details.

*Monthly. †Quarterly. §Semi-annual.

ASSESSMENTS.

Table with columns for Name of Company, Location, Delinq., Sale, and Amt., listing companies and their assessment details.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alice, Mont., Amalgamated, etc., with columns for par value, Sept. 4-10, and sales.

†Assessment Paid.

Coal, Iron and Industrial Stocks.

Table of coal, iron, and industrial stock quotations, listing companies like Am. Agr. Chem., U.S. Steel, etc., with columns for par value, Sept. 4-10, and sales.

Total sales, 665,923 shares.

BOSTON, MASS.*

Table of stock quotations for Boston, Mass., listing companies like Adventure, Amalgamated, etc., with columns for par value, Shares listed, Sept. 4-10, and sales.

Total sales, 133,937 shares.

PHILADELPHIA, PA. §

Table of stock quotations for Philadelphia, Pa., listing companies like Am. Alkali, U.S. Steel, etc., with columns for par value, Sept. 4-10, and sales.

§Reported by Townsend, Whelen & Co., 209 Walnut St., Philadelphia, Pa. Total sales 11,853 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Anaconda, etc., with columns for par value, Sept. 1-6, and sales.

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 317,300 shares.

Colorado Springs (By Telegraph.)

Table of stock quotations for Colorado Springs (By Telegraph) listing companies like Acacia, Alamo, Anaconda, etc., with columns for par value, Sept. 4-10, and sales.

MEXICO.

Sept. 6.

Table of stock quotations for Mexico listing companies like Durango, Guanajuato, Angustias, etc., with columns for shares, last dividend, prices, and sales.

ST. LOUIS, MO.* Sept. 6.

Table of stock quotations for St. Louis, Mo. listing companies like Am. Nettie, Catherine Lead, etc., with columns for shares, par value, bid, ask, and sales.

TORONTO, ONT. Sept. 9.

Table of stock quotations for Toronto, Ont. listing companies like Center Star, Fairview, etc., with columns for par value, high, low, and sales.

LONDON.

Aug. 30.

Table of stock quotations for London listing companies like Anaconda, Copiapo, De Lamar, etc., with columns for authorized capital, par value, last dividend, and quotations.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

PARIS.

Aug. 21.

Table of stock quotations for Paris listing companies like Acieries de Creusot, Firminy, Huta-Bank, etc., with columns for country, product, capital stock, par value, latest dividends, and prices.

SALT LAKE CITY.* Sept. 6.

Table of stock quotations for Salt Lake City listing companies like Ajax, Ben Butler, Bullion-Bec, etc., with columns for shares, par value, high, low, and sales.

SPOKANE, WASH.* Aug. 28.

Table of stock quotations for Spokane, Wash. listing companies like American Boy, Ben Hur, Black Trail, etc., with columns for par value, high, low, and sales.

*From our Special Correspondent.

Total sales 2,960 shares. † Ex-Dividend.

All mines are in Utah. *By our Special Correspondent.

Total sales 16,000 shares. *Reported by Hunner & Harris.

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.
(See also Market Reviews.)

Abrasive—			Barium—			Graphite—Am. f.o.b. Provi-			Paints and Colors—		
	Cust. Meas.	Price.		Cust. Meas.	Price		Cust. Meas.	Price		Cust. Meas.	Price
Carborundum, f.o.b. Niagara Falls, Powd., F. FF. FFF.	lb.	\$0.08	Oxide, Am. hyd. cryst.	lb.	\$0.02½	dence, R. L. lump.	sh. ton	\$8.00	Metallic, brown	sh. ton	\$19.00
Grains	"	.10	Sulphate (Blanc Fixe)	"	.02	Pulverized	"	30.00	Red	"	16.00
Corundum, N. C.	.07@.10		Barytes—			German, com. pulv.	lb.	.01¼@.01½	Ocher, Am. common	"	9.25@10.00
Chester, Mass.	.04½@.05		Am. Crude, No. 1	sh. ton	9.00	Best pulverized	"	.01¼@.02	Best	"	21.25@25.00
Barry's Bay, Ont.	.07½@.09¼		Crude, No. 2	"	8.00	Ceylon, common pulv.	"	.02¼@.03¼	Dutch, washed	lb.	.04¼
Crushed Steel, f.o.b. Pittsburg	.05¼		Crude, No. 3	"	7.75	Best pulverized	"	.04@.08	French, washed	"	.01¼@.01¾
Emery, Turkish flour, in kegs	.03¼		German, gray	"	14.50	Italian, pulv.	"	.01¼	Orange mineral, Am.	"	.07¼@.08
Grains, in kegs	.05@.05½		Snow white	"	17.00	Gypsum—Ground.	sh. ton	8.00@8.50	Foreign, as to make	"	.08¼@.11¼
Naxos flour, in kegs	.03¼		Bauxite—Ga. or Ala. mines:			Fertilizer	"	7.00	Paris green, pure, bulk.	"	.12
Grains, in kegs	.05@.05½		First grade	lg. ton	5.50	Rock	lg. ton	4.00	Red lead, American	"	.05¼@.08
Chester flour, in kegs	.03¼		Second grade	"	4.75	English and French	"	14.00@16.00	Foreign	"	.06¾@.08
Grains, in kegs	.05@.05½		Bismuth—Subnitrate.	lb.	1.40	Infusorial Earth—Ground.	"		Turpentine, spirits	gal.	.47@.47½
Peeckskill, f.o.b. Easton, Pa., flour, in kegs	.01¼		Subcarbonate	"	1.65	American, best	"	20.00	White lead, Am., dry	lb.	.04¼@.04¾
Grains, in kegs	.02¼		Bitumen—"B"	"	.09¼	French	"	37.50	American, in oil	"	.05¼@.05¾
Crude, ex-ship N. Y.; Ab-	.02¼		"A"	"	.05	German	"	40.00	Foreign, in oil	"	.07@.09¼
bott (Turkey)	lg. ton	26.50@30.00	Bone Ash	"	.02¼@.02¼	Iodine—Crude.	100 lbs	2.45	Zinc, white, Am., ex dry	"	.04¾@.04¾
Kuluk (Turkey)	"	22.00@24.00	Borax	"	.07¼@.07¼	Nitrate	lb.	.05	American, red seal	"	.06¼
Naxos (Greek) h. gr.	"	26.00	Bromine	"	.40	True	"	.04	Green seal	"	.07
Garnet, as per quality	sh. ton	25.00@35.00	Cadmium—Metallic	100 lbs.	2.00@2.50	Oxide, pure copperas color	"	.05@.10	Foreign, red seal, dry	"	.05¼@.08½
Pumice Stone, Am. powd.	lb.	.01½@.02	Calcium—Acetate, gray	"	1.30	Purple-brown	"	.02	Green seal, dry	"	.06¼@.06¾
Italian, powdered	"	.01¼	"brown	"	.30	Venetian red	"	.01@.01¼			
Lump, per quality	"	.04@.40	Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jersey City, N. J.	sh. ton	70.00	Scale	"	.01@.03			
Rottenstone, ground	"	.02¼@.04¼	Carbonate, ppt.	lb.	.05	Kaolin—(See China Clay.)					
Lump, per quality	"	.08@.20	Chloride	100 lbs.	.75@.90	Kryolith—(See Cryolite.)					
Rouge, per quality	"	.10@.30	Cement—			Brown, white	"	.07¼@.08			
Steel Emery, f.o.b. Pittsburg	"	.07	Portland, Am., 400 lbs.	bbbl.	1.70@1.90	Nitrate, com'l.	"	.06			
			Foreign	"	1.65@2.25	"gran	"	.08¼			
			"Rosendale," 800 lbs.	"	.75	Lime—Com. abt. 250 lbs.	bbbl.	.80			
			Slag cement, imported	"	1.65	Finishing	"	.90			
			Ceresine—			Magnesite—Greece.					
			Orange and Yellow	lb.	.12	Crude (95%)	lg. ton	6.00@6.50			
			White	"	.13¼	Calcined	sh. ton	17.50@18.00			
			Chalk—Lump, bulk	sh. ton	2.50	Bricks	M	170.00			
			Ppt. per quality	lb.	.09¼@.06	Am. Bricks, f.o.b. Pittsburg	"	175.00			
			Chlorine—Liquid	"	.30	Magnesium—					
			Water	"	.10	Carbonate, light, fine pd.	lb.	.05			
			Chrome Ore—			Blocks	"	.07@.09			
			(50% ch.) ex-ship N. Y.	lg. ton	24.75	Chloride, com'l.	"	.01¼			
			Bricks, f.o.b. Pittsburg	M	175.00	Fused	"	.20			
			Clay, China—Am. com., ex-			Nitrate	"	.60			
			dock, N. Y.	lg. ton	8.00	Sulphate	100 lbs.	.75@.9½			
			Am. best, ex-dock, N. Y.	"	9.00	Manganese—Powdered,					
			English, common	"	12.00	70@75% binoxide	lb.	.01¼@.01¼			
			Best grade	"	17.00	Crude, pow'd.	"				
			Fire Clay, ordinary	sh. ton	4.25	75@85% binoxide	"	.01¼@.02¼			
			Best	"	6.00	85@90% binoxide	"	.02¼@.03¼			
			Slip Clay	"	5.00	90@95% binoxide	"	.03¼@.04¼			
			Coal Tar Pitch	gal.	.08	Carbonate	"	.16@.20			
			Cobalt—Carbonate	lb.	1.75	Chloride	"	.04			
			Nitrate	"	1.50	Ore, 50% Foreign	unit	.18@.19			
			Oxide—Black	"	2.28@2.30	Domestic	"	.30			
			Gray	"	2.28@2.40	Marble—Flour	sh. ton	6.00@7.00			
			Small, blue ordinary	"	.06	Mercury—Bichloride	lb.	.77			
			Best	"	.20	Nica—N. Y. gr'nd, coarse	sh. ton	33.00@38.00			
			Copperas—in bulk	100 lbs.	.37¼	Fine	lb.	.07@.02			
			in bbls.	"	.42¼	Sheets, N. C. 2x4 in.	"	.30			
			Copper—Carbonate	lb.	.18@.19	3x3 in.	"	.80			
			Chloride	"	.25	3x4 in.	"	1.50			
			Nitrate, crystals	"	.35	4x4 in.	"	2.00			
			Lump	"	.19	6x6 in.	"	3.00			
			Oxide, com'l.	"	.06¼	Mineral Wool—					
			Cryolite			Slag, ordinary	sh. ton	19.00			
			Selected	"		Selected	"	25.00			
			Blasting powder, A	25 lb. keg	2.65	Rock, ordinary	"	32.00			
			Blasting powder, B	"	1.40	Selected	"	40.00			
			"Rackarock," A	lb.	.25	Nickel—Oxide, No. 1	lb.	1.00			
			"Rackarock," B	"	.18	No. 2	"	.60			
			Judson R. R. powder	"	.10	Sulphate	"	.20@.21			
			Dynamite (20% nitro-glycerine)	"	.13	Oil—Black, reduced 29 gr.:					
			(30% nitro-glycerine)	"	.14	25@30, cold test	gal.	.09¼@.194			
			(40% nitro-glycerine)	"	.15	15, cold test	"	.10¼@.11¼			
			(50% nitro-glycerine)	"	.16¼	Zero	"	.11¼@.12¼			
			(60% nitro-glycerine)	"	.18	Summer	"	.09¼@.09¾			
			(75% nitro-glycerine)	"	.21	Cylinder, dark steam ref.	"	.08¼@.10¼			
			Glycerine for nitro (32 2-10° Be.)	"	.13@.13¼	Dark, filtered	"	.11¼@.15¼			
			Feldspar—Ground	sh. ton	8.00@9.00	Light filtered	"	.14¼@.17¼			
			French, Best	lg. ton	14.75	Extra cold test	"	.21¼@.26¼			
			Fluorspar—			Gasoline, 86°@90°	"	.16@.21			
			Am. lump, 1st grade	sh. ton	\$14.40	Naphtha, crude, 68°@72°	bbbl.	9.05			
			2d grade	"	13.90	"Stove"	gal.	.12			
			Gravel and crushed, 1st gr.	"	13.40	Linseed, domestic raw	"	.57			
			2d grade	"	12.40	Boiled	"	.59			
			Ground, 1st grade	"	17.90	Calcutta, raw	"	.75			
			2d grade	"	16.50	Okzerite	lb.	.11¼			
			Foreign, lump	"	8.00@12.00	Paints and Colors—					
			Ground	"	11.50@14.00	Chrome green, common	"	.05			
			Fuller's Earth—Lump	100 lbs.	.75	Pure	"	.16			
			Powdered	"	.80	Yellow, common	"	.10¼			
						Best	"	.25			
						Lampblack, com'l.	"	.04¼			
						Refined	"	.07			
						Litharge, Am. powd.	"	.04¼@.05¼			
						English flake	"	.08¼@.08¼			
						Glassmakers'	"	.07¼@.08			

THE RARE EARTHS.

	Cust. Meas.	Price
Boron—Nitrate	lb.	\$1.50
Calcium—Tungstate (Scheelite)	"	.80
Cerium—Nitrate	"	10.00
Didymium—Nitrate	"	35.00
Erbium—Nitrate	"	40.00
Glucinum—Nitrate	"	20.00
Lanthanum—Nitrate	"	20.00
Lithium—Nitrate	oz.	.60
Strontium—Nitrate	lb.	06¼@07
Thorium—Nitrate 49@50%	"	4.50
Uranium—Nitrate	oz.	.25
Yttrium—Nitrate	lb.	40.00
Zirconium Nitrate	"	8.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.