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The next number of the Engineering and Mining Journal—that for January 2d, 1897—will be, in accordance with our usual custom, a statistical number containing estimates of the production of the United States for the year which is now rapidly approaching its close. The collection of statistics for the Journal and for The Mineral Industry goes on without intermission through the year, and we hope to be able to present our readers in this number with close estimates of the production of the principal metals and minerals in the United States, with estimates of the gold production of the world, and with a great variety of other statistical information, including reviews of the various industries, and comments on the course of the mining stock markets in this country and in Europe. In nearly every instance our early estimates of production for 1895 were supported by the facts as more fully collected at a later period in the year, and we have taken great pains to approximate as closely as possible, and in the same way, the output of the mineral industries for 1896.

The new mining districts in British Columbia are receiving powerful aid in advertising their future possibilities from the Canadian Pacific Railway Company, a corporation which of course has a very strong interest in promoting settlement and business in that Province, which at present furnishes it with an amount of traffic not at all satisfactory. The Canadian Pacific Company has already done a great deal in promoting interest in British Columbia mines in the Eastern Provinces of the Dominion, where a good deal of capital has been invested. More recently it has opened a special exhibition of samples of ores at its London offices, where they have been seen by a large number of persons. The company does not undertake to advertise individual mines, but districts; nevertheless the interest of owners who wish to sell their claims will doubtless be promoted by the exhibition of samples of ore. The danger in this case is that the company may not discriminate, but may be willing to further so far as it can without becoming directly responsible therefor, the interests of promoters and others, the natural disposition of course being to assist anything which will bring traffic to its line. There has been a good deal of talk of British Columbia mines in London, but the time at present is not at all propitious, and there will be but little chance for a new district until the present depression in South African and West Australian mining shares passes over.

The explosion in Baltimore shaft No. 2, at Wilkes-Barre, Pa., a mine owned by the Delaware & Hudson Canal Company, an account of which is given in another column, has, at this writing, not been positively accounted for. One supposition is that it was caused by 26 sticks of dynamite which were set off by a fire which got beyond the control of those who had purposely kindled it. This does not seem credible, first, because fires are seldom kindled in mines, and never in so careless a manner that they could get beyond control, and second, because the presence of the dynamite must certainly have been known, and its removal been accomplished as soon as the fire threatened to spread. The other and more plausible explanation is that an open light carried by a workman ignited a gas feeder which continued to burn, and produced the smoke mentioned. This cause would also account for the large quantities of afterdamp that came so near proving fatal to a number of the 27 men who were in the mine at the time. The almost entire absence of violence in explosion seems difficult to understand, under either supposition. If the second cause should prove to be the true one, it emphasizes the need editorially referred to recently in these columns, of a safe lamp of good illuminating power for the use of workers in coal mines. Such a lamp would materially reduce the number of fatalities that are now so frequent.

While there are many points open to criticism in English company regulation and practice, there is one which deserves both commendation and imitation on our part in this country. That point is the custom of requiring an independent audit of company accounts. In this country the auditor, if a company has such an officer, is simply a chief book-keeper, who is entirely under the control of the company; in England the auditor is chosen by the stockholders and not by the directors, and is an accountant—more usually a firm of accountants—by profession, whose entire business is that of auditing and revision. These officers are expected to be independent; they can, and frequently do, criticize the methods of companies and suggest improvements. From their position and the fact that they are experts, such suggestions are sure to receive attention, and instances are numerous in which abuses have been stopped by the auditors, besides many in which savings have been effected by the correction of faulty or obsolete accounting systems. Of course, there is a possibility of collusion where fraud is intended; but the danger is very much reduced, as the auditors would run the risk of losing not only reputation, but also a business, which is generally a large and profitable one in the case of expert accountants of standing.

Such a system in operation here would have saved us many of the scandals which have inflicted serious damage on the general reputation of our corporate managements, and have caused much distrust. To take

instances a little outside of our immediate field, it would have prevented any such cases of defective accounting as were shown in the Atchison, Topeka & Santa Fe case, or more recently in the Baltimore & Ohio Railroad Company. Moreover, it stimulates directors and managers to greater care, and furnishes a safeguard to the shareholders which is much needed.

The United States Court of Appeals for the New York Circuit has now before it a question which has come up from time to time, but which we believe has never been legally or satisfactorily decided. The question at issue is on an appeal from the Circuit Court for the Northern District of New York and involves the points whether gas is a mineral, and if so, what kind of mineral it is. In the present case the Buffalo Natural Gas Fuel Company, which owns a number of wells in the Province of Ontario, Can., laid its pipes across the border to the city of Buffalo, and proceeded to supply the gas to various customers in that place. The Collector of Customs for Buffalo classified the natural gas as dutiable at 10 per cent., claiming that it came within that clause of the tariff law which provides that "all raw or unmanufactured articles not enumerated in this act must pay 10 per cent. duty." The company appeals from this decision, but in May, 1893, the Board of General Appraisers reversed the decision of the Collector and sustained the claim of the company, holding that natural gas is exempt from duty under section 651 of the tariff law, which exempts "minerals, crude or not advanced in value or condition by refining, grinding or other process of manufacture," and which are not specially provided for elsewhere in the act. This decision of the board was again confirmed by the United States Circuit Court, but an appeal was taken from that decision on behalf of the Collector of the Port at Buffalo, and it is this suit which is now on trial. The collector maintains his original classification, but the company supports the view that natural gas is crude mineral or bitumen, and hence exempt. On either side a formidable amount of expert testimony has been adduced, which, of course, amounts merely to an expression of opinion, carrying more or less weight according to the character or standing of the expert. The case would appear to be a tolerably simple one, natural gas being certainly as much a mineral product or a result of mineral working as is petroleum; but the learned judges of the court will doubtless reach their own conclusions.

And now comes to disturb all our accepted notions of astronomy, geography and everything else one Cyrus R. Teed, of Chicago, who has an entirely new theory of his own which he is about to demonstrate—according to his own account—so clearly that it must be at once accepted of all men. We have always supposed that we lived on the outer surface of a spherical body and that when we burrowed into the earth we were making some progress toward the center, however small our excavations might be when compared with the bulk of the total globe. Not so says Teed; the earth is a hollow globe and we are living on its concave inner surface, while the sun hangs in the center of the great spherical cavity. Now a good many years ago an eccentric navigator named Symmes maintained that the center of the earth was hollow and filled with water, but even then he admitted that we were on the outside of the terrestrial ball. Teed, however, is positive, but as some consolation for our disappointment at finding ourselves shut up in what must seem to the imagination like a spherical prison, no matter what is its size, he assures us that the outer shell is composed of pure gold. The little fragments of the yellow metal which we manage to gather together are simply drops from this external shell which have filtered through the cracks, and vein formation is thus at once accounted for. Unfortunately he does not say how thick the shell is, nor how much further we have got to bore through it before we reach this tremendous outer crust, and so obtain control of unlimited supplies of standard money. The demonstration of the concavity of the earth's surface is to be begun in Florida before long, we are assured. Meantime not many believers seem to be gathering around the new doctrine. The originator recently sent a lieutenant—one Samuel Miller, of Herkimer County—to the city of New York for the purpose of expounding the theory. Unfortunately his first audience consisted of only three persons, which shows how hard-headed and stubborn the present generation is. Perhaps a few more can be attracted when the organization of the Outer Crust Gold Development and Transfer Company shall have been completed, and arrangements made to give some of us at least a chance at the wealth which, according to Teed, is there awaiting us.

#### Electric and Other Power Transmissions.

The recent successful beginning made in the transmission of power by electricity from the plant at Niagara Falls to the city of Buffalo is, we believe, the beginning of an economic change of great importance. At present a force equivalent to 1,000 horse-power is sent to Buffalo and is used in operating the street railroads of the city; but the Niagara Falls

Company is under contract to increase the transmission to 10,000 horse-power by June next, with the probability of a still further growth as the arrangements for distributing and using the power are completed. So far the transmission has worked very smoothly and successfully, but it has not been in operation long enough to reach a definite conclusion as to the proportion of loss and the percentage of the force actually utilized in work performed. The main fact is that the supply of a large city with power from a distant source on a large scale has actually been begun. Long-distance transmission of power to single plants has been carried on for some time, but not for general distribution, as is contemplated in Buffalo, and will certainly be carried out in that city within a few months.

Now, there are very few of our large cities which are situated like Buffalo, within a comparatively short distance of a natural source of almost unlimited power, such as is found in Niagara Falls. Unless the practical radius of transmission is increased by new devices or inventions the number of towns which can be supplied from water-powers is limited. We have, however, a number of large cities which are within easy reach of coal mines which could supply the fuel for great power plants, which might be erected on such a scale as almost to equal the natural water-powers in economy of production. There is every probability that in this direction will be found our next great industrial development in this country.

We have before pointed out the great economies to be realized in this way, and it is hardly necessary now to go over them again in detail. The consumption of fuel and its conversion into either gas or electricity at points close to the mines would not only save the cost of the preparation for market now required and of the transportation: it would avoid a large part of the waste and loss which now occurs at the mines, as substantially all the coal taken out could be consumed, and with it probably a large part of the culm and dust piles which are now found at almost every mine. The economies of steam or gas production on a large scale could be fully realized. The cost of storing coal and of distributing and delivering it to individual consumers in the cities, which amounts in the aggregate to a very large sum, would be saved. While, of course, the expense of transporting and distributing gas or electric power would be considerable, we believe that it would be trifling in comparison with that of handling the coal itself as is now done. And in addition there is to be considered the labor and cost of firing with coal, the removal of ashes and the like, matters difficult to estimate because they are so much subdivided, but certainly amounting to a great total; to say nothing of the difficulties attending such work in a large city.

Of course, it will require time to bring about such a change, especially as it will be opposed by many large interests. The great sums invested in railroads which are chiefly supported by the carrying of coal; the large amounts also invested in the present machinery of the coal trade, and the other interests which would be affected by such a change would all be ranged against it, and their opposition would take time to overcome. As in all important industrial changes, injury to a few would be the immediate result; but this would be far overbalanced by the general benefits secured.

Whether gas or electricity will be the form most generally adopted for the transmission of power as well as heat and light admits of much variation in opinion, and the field is certainly open for discussion. The comparatively recent development of electricity, and the probability that great advances will be made hereafter in that direction, present an element of uncertainty in the problem. At present it seems as if in many cases the conversion of coal into gas and its transmission by pipes to the points where it is needed would be upon the whole the best solution; but there are plenty of grounds upon which the electrical people may contest this point.

The use of gas fuel is familiar to many of our people through the general employment of natural gas in Pittsburg and in the towns and cities of the gas belt in Ohio and Indiana. In many manufacturing establishments also the use of the Taylor and other forms of gas-producers is becoming common, while the gas engine is rapidly coming into general use. An instance of the introduction of producer gas for ordinary city use was given in our last issue, and other cities will soon follow the precedent there set.

Should gas be generally adopted in this way it would be practicable to supply it to a very large part of our cities and towns by piping direct from the mines. There are only a few districts, such as New England, in the East and a large section of the Pacific coast, which are beyond reach of such pipe-lines. In those districts a great part of the area could be supplied from plants located on the sea-coast or at points where coal could be delivered at very low rates. This is the plan proposed in Boston, which will probably soon be carried out; it is already on trial at Halifax in Nova Scotia.

The subject is so large that it can be treated but very slightly in a single article, but we hope that discussion may be called out. Undoubtedly many engineers recognize the fact that a change is coming and some are preparing themselves accordingly.

## The Anaconda Report.

The first impression which the figures of the Anaconda Copper Mining Company's report gives us is of the extent of the operations of the company. The total sales for the year ending June 30th last, which is the period covered by the statements, amounted to \$11,929,904, and at the close of the year the company was carrying, in complete form or under treatment, a stock of metals amounting in value to \$4,888,020. Moreover, the Anaconda, besides operating mines and reduction works, the sales from which reached a total of 85,476,795 pounds of copper, 4,498,560 ounces of silver and 14,384 ounces of gold, owns coal mines, town-sites, stores, saw-mills and other property; furnishes the town, which is chiefly inhabited by its workmen, with water, electric light and street railroads; owns the railroad which connects its mines and reduction works, some 50 miles of main line and branches, and altogether does business on a gigantic scale.

This first report of the company under its present organization is somewhat disappointing because it does not go so fully into details as might be desired. The expenses especially are lumped in a way which makes it difficult to ascertain the cost of the product, and are only separated under the two general heads of mining and reduction work. We are assured, however, that changes are being made in the system of accounting, and that future reports will enter fully into details of expenses and costs.

From the company's profit and loss account, which is given on another page, we find that of the total receipts from sales, copper furnished 71.9 per cent., silver 25.6 per cent., and gold 2.5 per cent., the average price realized for the copper being 10.03 cents per pound, and for the silver 67.91 cents per ounce. It would appear, however, that these sales did not represent the entire output of the year, since there was a net increase in the values of metals on hand at the close of the year over that reported at its opening of \$4,139,726, which should fairly be added to the sales to represent the production. The chief cause of this large increase in stocks, it may be noted, is the fact that the company is now refining a large proportion of its product in its own works, and is shipping in finished marketable form the metals which were formerly sent to other works for the final treatment.

We should note also that the profits for the year on what the company calls its "subsidiary departments," which include its towns with their water and light supplies, its coal mines and coke ovens, its stores and its saw-mills, amounted for the year to \$829,486. This profit, however, does not appear in the receipts, but is deducted from the working expenses. The general or office expenses of the company are remarkably light, the total both in Anaconda and New York amounting to less than 1 per cent. of the sales of produce.

Making the additions and changes noted above, we have the following statement of net income and expenses:

Sales of metals.....	\$11,929,904
Increase in stocks of metals.....	4,139,726
Total.....	\$16,069,630
Mining and reduction, less subsidiary profits.....	9,858,708
Refining charges at seaboard.....	1,248,214
Freights, railway and ocean.....	586,922
General expenses.....	109,069
Interest paid, less royalties, etc., received.....	8,202
Total expenses.....	\$11,811,115
Profit.....	\$4,258,515

Under this showing the expenses were 73.5 per cent. of the income, leaving 26.5 per cent. as profit. Of these expenses approximately 40 per cent. were for mining; 54 per cent. for reduction and refining charges and 6 per cent. for miscellaneous charges.

The average receipt for the copper sold, according to the company's statement, as given above, was 10.03 cents per pound. For the actual cost of the copper made it is difficult to obtain an exact estimate. If we regard the gold and silver as simply by-products, and charge up the total amount of expenses to the copper, including that on hand as well as that sold, we find that the cost of the latter would reach a total of 10.26 cents per pound; that is, it would appear that the copper cost a little more than the selling price, and that the entire profit was derived from the gold and silver. If, on the other hand, we apportion to the copper a percentage of the expenses equivalent to its percentage of the total proceeds, we find that its cost would be about 7.37 cents per pound. The final result is, of course, the same in both cases. Neither statement would be entirely fair, and it is probable that the actual cost of the copper, with a just division of expenses, would be between the two figures given. To ascertain it exactly, however, would require a fuller and more detailed statement of expenses than that presented in the report.

The increase in the capacity of the Anaconda refinery, made during the past year, enables the company to treat in its own works a much larger proportion of the crude product than heretofore. But the report states that a considerable portion, about one-half, is still to be sent to Baltimore to be refined, but under a new contract by which the charges for this work are to be considerably reduced. The subsidiary departments seem to have been generally so handled as to yield a profit. Under

the circumstances in which the mines and property of the Anaconda have grown up most of these were a necessity, since there were no sources from which the company could obtain its timber, firebrick, coal and other supplies at anything like reasonable prices, and no way in which it could supply accommodations for its workmen and stores for their use without establishing them for itself. A very considerable amount of its capital is invested in these enterprises, but it seems upon the whole with good financial results.

## NEW PUBLICATIONS.

ELEKTRO-METALLURGIE. DIE GEWINNUNG DER METALLE UNTER VERMITTLUNG DES ELEKTRISCHEN STROMES. By Dr. W. Borchers. Braunschweig, Germany; Harald Bruhn, 1896. Pages, 398; illustrated. Price, in New York, \$5.

This interesting book, undoubtedly ranking as one of the most important additions to our technical literature, was written by an engineer whose chief aim has been to describe the latest development in the art of electro-metallurgy. The author's large and varied experience has enabled him to succeed in attaining this object to a remarkable degree, and in the few instances in which he has failed, the failure was due entirely to the difficulty of obtaining accurate information and to the unprogressive secrecy which some electro-refiners still try to maintain regarding certain processes. Dr. Borchers treats the subject-matter clearly and concisely.

After a brief introduction, in which he explains the latest conception of electrolysis, he describes the extraction of the alkali metals and the metals of the alkaline earths by electro-chemical means. These are treated quite fully, and the illustrations are admirably executed. Of course, much of the information given in this part of the book is merely of historical interest.

In the section devoted to the metals of the earth group, and especially in treating the manufacture of aluminum, several features may be noticed. The author here, as elsewhere in his book, precedes his discussion of the modern electrical methods by a review of the purely chemical and fire methods of extraction, thus clearly showing the relative value of all the processes employed. In the case of Hall's and Heroult-Minet's aluminum processes, however, the author's judgment is not strictly correct. Dr. Borchers evidently bases his opinion that these processes are practically impossible (p. 136) upon a loose and tentative description in the patents of unessential features of the process, and upon the unsatisfactory results (p. 152) of his experiments on a small scale. Both of the above mentioned processes, nevertheless, are actually operated successfully on a very large scale, the Hall process being used by the Pittsburg Reduction Company at Niagara Falls, and the Heroult-Minet process by a company in Southern France.

Coming now to the extraction of the heavy metals, undoubtedly the most important chapter concerns the electrolytic refining of blister copper.

On page 182 is described the Siemens-Borchers method of supporting the cathodes, consisting in wrapping the strip of copper by which each cathode sheet is suspended several times around a wooden crosspiece until it meets the negative conductor, a small rubber strip serving to insulate it from the positive conductor. Simpler seems to be the arrangement, common in America, of suspending the cathode sheet by bending it over the supporting bar of copper.

The Borchers method of blowing air into the electrolyte for circulation and purification, and recently improved upon by Szontagh & Schneider (see article in the *Engineering and Mining Journal* of November 14th, 1896), is undoubtedly a very important improvement in the domain of copper refining. However, it might be well to state right here that the above method does not achieve the precipitation and removal of the arsenic, as sometimes claimed, nor does it altogether obviate the necessity of a separate system of circulation. The air circulation should be assisted during two or three hours in every twelve by the general circulation of the electrolyte from vat to vat.

The problem of the commercial purification of the electrolyte from dissolved arsenic salts has not yet been solved, so that the cumbersome blue vitriol crystallization still remains a necessary adjunct to every copper refinery.

Although the tanks used by Borchers are somewhat more expensive in construction than those ordinarily used, and although a plant constructed strictly according to the data given may be somewhat more expensive to operate, the cost of refining by the Borchers system—\$11.75 (58.95 marks) per ton of copper produced—seems rather high. The cost of refining blister copper (assaying 99% Cu) in the United States is about \$14 per ton at Anaconda, Mont., where laborers' wages average \$2.25 per day, and is \$9 per ton (exclusive of office expenses) at Perth Amboy, N. J., where lower wages (\$1.10 per day) are paid. The chief reason why American refineries operate more cheaply than European refineries, although the latter employ cheaper help (50 to 60 cents per day), lies in the fact that the average output here (34 tons daily) is very much greater than that of European refineries, the largest of which, in Germany, has a daily output of only five tons, and in England of nine tons. The mechanical contrivances for handling the material are also generally better in the United States than in other countries. The value of Dr. Borchers' book would have been largely enhanced, had the author seen and described our modern American copper refining works.

Another point of importance regards the current density used in refining. At Bridgeport, Conn., and Central Falls, R. I., with copper anodes comparatively free from arsenic and not containing over 60 oz. of silver per ton, current densities up to 200 amperes per square meter are regularly employed, as against a maximum of about 100 amperes, which Borchers states (p. 188) is used in Europe.

The author severely criticises Thofehrn's process and its lack of originality (pp. 189-190). Even if we admit these strictures, it must be allowed, however, that the mechanical features employed by Thofehrn are excellent in design.

On page 191 Stalman's arrangement of the electrodes is described, and is rightly characterized as "still born." The author errs, however, when he unequivocally condemns the Hayden process as impracticable, as this process is employed in the second largest copper refinery in the

United States (the Baltimore Electric Refining Works). The series system is also used with success in the Laurel Hill Works of the Nichols Chemical Company. As stated by Professor Fontaine in his "Electrolyse," p. 258, the principle underlying series systems and subsequently employed by Hayden (1886), Farmer (1885), and Hugon (1884) is based upon that of the old Volta pile, in which the zinc is replaced by the deposited copper.

Dr. Borchers ably describes and criticises the various electrolytic methods of extracting copper from its ores, none of which have been perfected so far that they have received the sanction of industry.

In the next section of Dr. Borchers' Electro-metallurgy, the extraction of silver is thoroughly and excellently treated, and Moebius' important inventions are given their just consideration. For later results reached by Moebius, see *The Mineral Industry*, Vol. IV.

The balance of the book gives some good data on the refining of gold, the electrolysis of zinc, cadmium, antimony, lead, etc. The author also treats of the manufacture of iron by the use of the electric furnace, for which a great future may be possible. Many works have now adopted the method of electrically heating and welding iron, which is described in detail.

The chapter on nickel and cobalt contains but few new data. Borchers does not even mention the fact that the electrolytic refining of nickel anodes, containing 95% Ni, is commercially carried on, although the Balbach Smelting & Refining Company has been producing electrolytic nickel at Newark, N. J., for at least three years. The company referred to has also succeeded in electro-depositing quite thick nickel plates which can stand direct mechanical treatment as well as copper cathodes.

In concluding his review, the writer believes that Dr. Borchers' classification of the subject matter is not always strictly natural. For example, sub-headings 2, 3 and 4 under the "Electrolysis of Aluminum Ores," do not cover three strictly distinct general methods, for subhead 2 may embrace the other subheads. Furthermore, the fluxed aluminum ore charge may be melted by heat due both to the combustion of fuel, and to the electrical resistance of the bath. Likewise, taking the caption Lead "Electrolysis," subhead 1 may embrace 2 and part of 3. In other respects there is very little to criticize in the general arrangement of the contents of this interesting book, which may be recommended to every one interested in the modern development of electro-metallurgy.

#### BOOKS RECEIVED.

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

*Revista del Servizio Minerario nel*, 1895. Rome, Italy; National Printing Office. Pages, 323.

*The Story of American Coals*. By William Jasper Nicolls. Philadelphia, Pa.: J. B. Lippincott Co., 1897. Pages, 405; with frontispiece. Price, \$3.50.

*Annual Report of the Director to the Board of Trustees, Field Columbian Museum, for the year 1895-96*. Chicago, Ill.: published by the Museum. Pages, 165.

*Report of the Commissioner of Education for the year 1894-95. Volume I*, containing Part I. Washington, D. C.; Government Printing Office, Pages, 1,152.

*Gas and Fuel Analysis for Engineers*. By Augustus H. Gill. New York; John Wiley & Sons. London, Eng.; Chapman & Hall, Ltd. 1896. Pages, 89; illustrated. Price, \$1.25.

*Second Annual General Report upon the Mineral Industry of the United Kingdom of Great Britain and Ireland, for the year 1895*. By C. Le Neve Foster, Inspector of Mines. London, Eng.; H. M. Printers. Pages, 191; with maps and diagrams. Price, in New York, \$1.10.

#### 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.

#### Condition of Gold in Parting.

Sir: In looking over a recent metallurgical work I notice that the author says we may tell the size of the grains of gold in the ore by the action in parting, fine gold always resulting in minute particles, and being inclined to float. Is this a fact, or is it the amount of silver present that decides the question? J. S.

SAN FRANCISCO, Nov. 22, 1896.

#### The Intrinsic Value of Gold.

Sir: I would be greatly obliged if you would answer the following question. It seems to me that at the present time the answer will be of sufficient interest to be published in your *Journal*:

What would be the selling price of the amount of gold in a gold dollar if computed on the same basis as the selling price of iron, lead, etc., is determined, namely, by adding a reasonable mine-owner's profit to the cost of mining and refining? If the amount of silver in a gold dollar is appreciable, please also give its value.

I am well aware of the fact that the market price of any metal depends on the demand and supply, as also on the control of trusts, and in the case of gold and silver, on the use of these metals for coinage; but what I desire to know is what is the true value of the gold if considered entirely separate from this, if it is possible to so consider it. If it is not possible to compute such a value which would be independent of what might be termed the standard price paid for it by the United States mints, then please state if possible what is the average cost to what might be called the producer of this amount of gold, adding to the cost of mining and refining a reasonable interest and depreciation of the plant and interest on the original cost of the property, just as a manufacturer, free from any connection with a trust, would compute the cost price of his goods.

PHILADELPHIA, Dec. 20, 1896.

C. H.

[In *Universal Bimetalism*, by R. P. Rothwell, second edition, 1896, it is stated: "The demand for gold and silver has always been due to their use in money; the uses in the industries, chiefly as ornaments and articles of luxury, are due rather to the fact that the metals are used in, and are easily convertible into, money than to their intrinsic physical properties, so that it may be said that almost the entire demand for both gold and silver has always been on account of their use in money. It is because their possession is an evidence of wealth, and brings to their possessor the consideration and homage of his fellows, that there is a demand for them, and not because their physical properties are so superior to those of many other metals as to justify the difference in their prices. There is not now and never will be any large use in the industries dependent upon the intrinsic properties of either gold or silver that would give it a value at all comparable with its present price, or that would induce its production in large amounts."

The price of anything is, of course, dependent upon the law of supply and demand. It must be remembered that the cost of a great part of the gold produced is fully equal to its market price, which is its commercial value. Some, indeed, costs much more than this, for many unprofitable mines are worked in the perennial hope that they will strike a bonanza. A large part of the gold from rich mines is produced at a profit, but when it is asked "what is the intrinsic value of gold" or silver either, it may be said that it is what it will bring in the market; and beyond this the average cost of production will not be far from the commercial value. If the market price increases, it of course increases the profit on the working of rich mines, but it also induces the working of lower-grade ores, so that the profits on the whole quantity produced by no means increase proportionately with the advance in price.—Ed. E. and M. J.]

#### ABSTRACTS OF OFFICIAL REPORTS.

##### Anaconda Copper Mining Company, Montana.

This report, the first issued by the company under its present organization, covers the year ending June 30th, 1896, and is given below as nearly in full as possible, owing to its importance. The balance sheet as of date June 30th, 1896, is as follows:

LIABILITIES.	
Capital stock, 1,200,000 shares of \$25 each.....	\$30,000,000
Loans, outstanding drafts, pay rolls, etc.....	3,609,695
Profit for the year.....	\$4,258,515
Less dividend No. 1, May 1st, 1896.....	750,000
Less dividend No. 1, May 1st, 1896.....	3,508,515
Total liabilities.....	\$37,118,180
ASSETS.	
Mining claims and properties.....	\$19,196,978
Lands and improvements at Butte.....	255,802
Reduction works at Anaconda.....	6,470,422
Subsidiary departments.....	4,755,319
Shares in other companies.....	546,520
New York office fixtures.....	380
Supplies on hand at Butte and Anaconda.....	175,126
Copper, silver and gold on hand and in treatment.....	4,888,020
Bills and accounts receivable, cash and advances.....	826,113
Total assets.....	\$37,118,180

The item of mining properties was increased \$18,568 by purchases during the year. The cost of the reduction works at Anaconda was increased \$540,507 for the new refinery erected during the year. The shares in other companies include \$510,000 invested in the Butte, Anaconda & Pacific Railroad, and \$36,520 in other stocks. The item of subsidiary departments is made up as follows: Machine shops and foundry at Anaconda, \$385,209; stores and merchandise at Anaconda, \$303,632; stores and merchandise at Butte, \$275,179; coal mines and plant at Belt, \$865,131; stores and supplies at Belt, \$61,865; hotel, \$108,218; water supply in city of Anaconda, \$145,425; electric lighting and tramways in Anaconda, \$399,858; fire-brick and clay plants, \$153,819; real estate, water supply, timber, saw-mills and stores at Hamilton, \$1,797,003; real estate in city of Anaconda, \$234,065; sampling works at Butte, \$25,992.

The profit and loss account for the year is given below:

Sales of copper, 85,476,795 lbs.....	\$8,578,177
Silver, 4,498,560 fine oz.....	3,157,185
Gold, 14,384 fine oz.....	296,542
Total sales of produce.....	\$11,929,904
Royalties, rents and other receipts.....	127,774
Copper, silver and gold on hand June 30th, 1896, being estimated value of metal in process of treatment and in completed state.....	4,888,020
Total receipts.....	\$16,945,698
Valuation of cupreous material on hand July 1st, 1895.....	748,294
Mining, all expenditures.....	\$5,071,677
Reduction works, all expenses, except for new refinery.....	5,616,517
Total.....	\$ 0,688,194
Less profits from subsidiary departments.....	829,486
Freights, railway and ocean.....	\$9,858,708
Refining charges at seaboard.....	586,922
Interest on advances.....	1,248,214
General expenses, Anaconda.....	135,975
" " New York.....	46,351
Total expenses.....	67,719
Total expenses.....	\$12,687,183
Balance, profit for the year.....	\$1,258,515

The average price received for copper was, therefore, 10-03c. per pound, and for silver 67-91c. per ounce. Of the receipts from sales the gold furnished 2-5%, silver 25-6%, and copper 71-9%. The total cost of production, including refining charges at the seaboard, was \$11,106,922. There was during the year an increase of \$4,139,726 in the value of metals on hand and under treatment.

The report of the trustees for the year is as follows: "During the year 107,036,697 lbs. of fine copper were shipped from Anaconda in the form of electrolytic bars, anodes or converter bars. The sales during the same period amounted to 85,476,795 lbs. of fine copper, 4,498,560 fine ounces of

silver and 14,384 fine ounces of gold. On June 30th, 1896, the stocks of copper, silver and gold on hand were valued at \$4,888,020. Since that date these stocks have been practically all sold, realizing a larger amount than this valuation. The total expenditures at the mines were \$5,071,678, which includes about \$355,000 expended in equipping and developing non-producing mines, and about \$361,000 for new machinery and plant for the producing mines. The total expenditures at the Reduction Works at Anaconda, exclusive of the cost of doubling the electrolytic refinery, were \$5,616,517, which includes about \$519,000 expended in improving concentrating, furnace and converter plants. This expenditure of \$1,235,000 in the year on new machinery, development work, improvements, repairs, etc., all of which is charged to expenses of operation, renders it unnecessary, in the opinion of the trustees, to make any specific provision for depreciation of plant and machinery, especially as it has been the endeavor to maintain the same in the highest state of efficiency.

"The profits from the subsidiary departments, amounting to \$829,486, have been deducted from the costs of mining and reduction in Montana. In the accounts for the coming year these profits will probably not show so large, as considerably lower prices for coal, coke, timber, etc., will be credited to the departments, thus directly diminishing the costs of mining and reduction. These reduced prices, which will still allow the subsidiary interests to show reasonable profits, are very satisfactory evidences of the wisdom of the management in having developed the timber, coal and other auxiliary properties of the company. During the year, \$135,975 was paid for interest on advances, the rate being an average of 5% per annum on current balances, the company having the right to pay off such advances any time. On June 30th, 1896, the company's total indebtedness was \$3,600,000, with an offset of about \$1,000,000 in cash, bills receivable, etc., exclusive of unrealized stocks of copper, silver and gold. By reference to the balance sheet of July 1st, 1895, it will be seen that on that date, when the properties were taken over by the company, it was provided with very little working capital; since then the accumulated profits have put it in better financial position, but there was still due by the company on June 30th last \$2,273,795 for advances. From the time that the ore from the mines is extracted and delivered to the reduction works, an average period of from four to five months elapses before the copper, silver and gold produced are paid for, rendering requisite a capital of over \$4,000,000 to carry such product. In addition, the stocks of supplies carried at the mines, reduction works, saw-mills, coal mines, etc., amount to nearly \$1,000,000, thus requiring a working capital of fully \$5,000,000. Should the future operations of the company be sufficiently prosperous, it is the opinion of the trustees that it will be a wise and conservative policy to accumulate perhaps \$2,000,000 more from any surplus profits above the present rate of dividends (\$3,000,000 per annum), so that the company can itself provide all the funds needed for its business.

"The profit and loss account for the year shows a profit of \$4,258,515; \$500,000 should be deducted from this on account of the undervaluation of stocks on July 1st, 1895, as noted by the auditors, and an addition made for undivided profits of the Butte, Anaconda & Pacific Railway, in which the company holds a controlling interest. In round numbers, the accounts show a profit of about \$4,000,000 as the result of the operations of the company for the year. During the year a considerable sum has been expended in completing the equipment of the coal, coke and timber departments. All these are now in excellent working condition, and for the year 1896-97 no noteworthy expenditures for capital will be required for them.

"A new contract, which will become operative about the beginning of 1897, has been entered into with the Baltimore Copper Smelting and Rolling Company for refining one-half of the company's product. This new contract is on more favorable terms than the old one, and will considerably diminish the charges, which, as shown in the present accounts, have been made for refining on the Atlantic seaboard. The electrolytic refinery at Anaconda has now the capacity of treating the other half of the company's products.

"The accounts of the company and of its subsidiary departments are very elaborate and have required much time from the accountants and auditors for their preparation and audit for this first year; but now that a regular system has been inaugurated it is hoped that hereafter the annual report will be presented to the shareholders at a much earlier date than was this year practicable."

The report of Mr. Marcus Daly, superintendent of the company's operations in Montana, is as follows: "During the year there was shipped to the Reduction Works at Anaconda 1,255,874 tons (of 2,000 lbs., dry ore) of ore, of which 529,368 tons came from the Anaconda group of mines and 726,506 tons from the Syndicate group and other mines. This is a very much larger product than ever before, exceeding that of any previous year by some 350,000 tons, and was produced without any forcing of the mines. During the year an unusual amount of development work was done on the producing mines, with the result that at the end of the year the reserves of known ore were considerably larger than they were at the beginning of the year. For new machinery, replacements and other work not directly chargeable to mining, the sum of \$360,981 was expended on these mines. On the non-producing mines the sum of \$355,435 was expended for machinery and developments, the largest item being \$158,012 for the Camp Creek mines, situated some 25 miles south of the mines at Butte. All these amounts have been charged in our accounts to the cost of mining.

"Reduction Works.—There was received at the reduction works 1,276,156 tons of ore, of which 20,282 tons were purchased, the remainder coming from the mines of the company. There was shipped from Anaconda 107,036,697 lbs. copper, 5,308,955 oz. silver and 18,300 oz. gold, contained in either converter bars, cast and refined copper or bullion. The stock on hand of these metals at Anaconda was larger at the end of the year than at the beginning. The yield of copper compares not unfavorably with that of the preceding year; but there was a considerable falling off in silver and gold percentages. During the year the converter plant was enlarged and improved, and new machinery and renewals carried out at the smelting and concentrating plants, involving an outlay of \$518,643, which was charged to reduction expenditures. The capacity of the refining plant was doubled, so that now, if operated to its full limit, 6,000,000 lbs. copper can be refined in a month; the cost of this enlarge-

ment was \$540,507, which has been charged to capital. The reduction works are now in more perfect shape than ever before.

"Subsidiary Departments.—The operations at these departments during the year resulted in an aggregate profit of \$829,486. As the mines and reduction works consumed by far the largest part of the sales entered on the books of the several departments, this profit is properly a reduction in the cost of working expenses, and has been so considered. For the year 1896-97, the prices of timber, coal, etc., etc., will be much reduced, so that while the apparent profits of the various departments will be diminished, the final results for the company will be the same.

"During the year, as will be observed in the accounts, a considerable amount of fresh capital was invested in the coal, timber and other departments, but now the capacity of these several plants is believed to be equal to any future requirements of the Anaconda Copper Company, with the exception of the Light, Power and Water departments, which deal directly with the public, and where extensions may be necessary as the population of the towns of Anaconda and Hamilton increases. The saw-mills cut nearly 12,000,000 ft. of lumber per month; the coal mines produce 60,000 tons of steam and furnace coal per month, and the coke ovens 2,700 tons of coke per month; these figures afford a good illustration of the magnitude of the company's operations at Butte and Anaconda. The much diminished cost of coal, timber, coke, etc., compared with the preceding years, proves the wisdom of the large expenditures for these departments, amounting, on June 30th, 1896, to \$4,755,399.16.

"Butte, Anaconda & Pacific Railway.—This line connects the mines at Butte with the reduction works at Anaconda. The main line between the two towns has a length of 26 miles, while the branches have an additional length of 24 miles. This railway is now in admirable condition for the heavy traffic passing over it, and is making good profits with the present low rate of 35c. per ton for ore, coal and coke. In years past, the rate for ore was from 40 to 60c. per ton. This company owns 51% of the shares of this railway.

"Conclusion.—My anticipations for the present year (1896-97) are very favorable. The mines are in good shape for producing ore in large quantities, and at the deepest places in three of the mines—the St. Lawrence at 1,200 ft. vertical, the Bell at 1,300 ft. vertical and the Mountain Consolidated at 1,100 ft. vertical—bodies of good grade ore are being developed, thus promising well for the future of the mines with increasing depths. The reduction works are in excellent condition and are running with great smoothness. The cost of supplies of coal, etc., will be less than ever before, so, that unless something unforeseen should happen, I expect that the cost per pound of copper will show a marked reduction in the future compared with the present statement. During the past year something over \$1,000,000 of our profits has been absorbed in permanent improvements. For the present year I anticipate such additions will be kept in very moderate limits. An expenditure at the reduction works of, say, \$40,000 for a silver bullion plant and office will be required, while the extraordinary expenses charged in the year 1895-96 to reduction will, I think, be much less for the present year. At the mines we are erecting two powerful hoisting engines, with a capacity to hoist from a depth of 3,000 ft. vertical, but the cost of these engines and other new machinery will be charged to mining, and, although the development work will be most vigorously pushed forward, I do not expect that the extraordinary mining costs will be larger this year than was the case in 1895-96. The timber and coal departments will absorb for 1896-97, say, \$146,000 new capital and perhaps some enlargements may be needed for the water supply of the town of Anaconda. Therefore, my expectation is that the profits shown in the next annual statement will be nearly all available, either for dividends or for additional working capital."

**Artificial Refrigeration in the Tempering of Steel.**—Mr. W. C. Kerr, says, in *Cassier's Magazine*, that in the tempering of steel or the cooling of other articles in a bath of special composition of such cost that it cannot well be run to waste, as oil or brine—the necessity arises of removing the heat surrendered by the material cooled, thus keeping a constant temperature in the dipping tank. In the case of saw tempering, a large volume of brine is refrigerated and circulated through the dipping vat. The large reserve volume acts as a fly-wheel, equalizing the fluctuations of temperature arising from varying rates of dipping, the compressor running continuously.

**Iron Works in Sussex, England.**—In view of the development of the new coalfield at Dover, it is stated that the re-establishment of ironworks on a large scale in Sussex is contemplated, says the *London Engineer*. Iron ore is found plentifully in Sussex, which until the year 1720 was the principal center of iron manufacture in England, the iron rails round St. Paul's Cathedral in London having been cast in Sussex. The last furnace in Sussex was extinguished at Ashburnham in the year 1828. The fuel used for the smelting was charcoal; but the country became denuded of timber, in consequence of which acts of Parliament were passed prohibiting the furnaces. It has only been the question of the price of coal which has prevented the iron ore being worked in Sussex. In the time of the Romans iron was smelted there.

**Mineral Imports and Exports of Spain.**—For the 10 months ending October 31st, the imports of mineral fuel into Spain included 1,131,320 metric tons of coal and 178,669 tons of coke; a decrease in coal, but an increase in coke. Imports of iron and steel included 8,414 tons of pig iron, 11,413 tons of wrought iron and 16,099 tons of steel. The exports of minerals for the 10 months were as follows in metric tons:

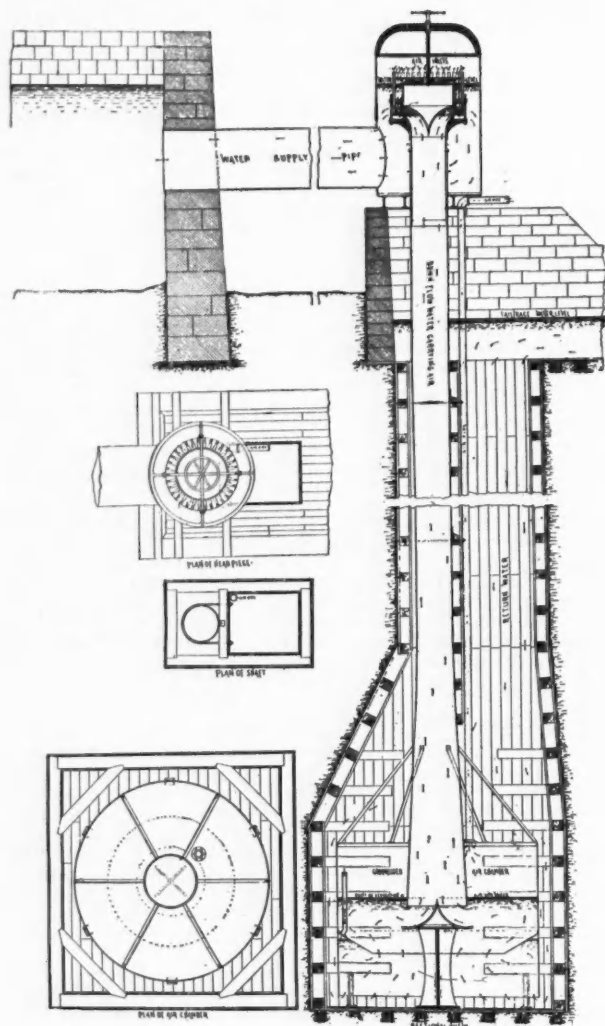
	1895.	1896.
Iron ore.....	4,289,697	5,521,797
Copper ore.....	451,309	566,933
Zinc ore.....	25,337	30,503
Lead ore.....	8,357	5,793
Salt.....	202,017	225,365

Exports of metals included 18,566 tons of pig iron, a decrease of 1,920 tons; 24,661 tons of copper, a decrease of 2,016 tons, and 183,160 tons of lead, an increase of 6,521 tons.

## THE TAYLOR HYDRAULIC AIR COMPRESSOR.

The Taylor Hydraulic Air Compressing Company, of Montreal, Canada, has recently put in operation at the Dominion Cotton Mills, at Magog, P. Q., a plant which deserves attention from the novelty of its application. It is intended to utilize water power through the direct compression of air, without the intervention of the usual mechanism. For this purpose, according to the company's plans, a low fall is quite sufficient, and in this point lies one of the chief advantages claimed for the system. The plant just referred to is the first one put in on a large scale, though a long series of experiments had previously been carried on. It was started up in September last and has since been run very satisfactorily, furnishing about 150 H.P.; all the printing engines in the mills, formerly run by steam, being now driven by compressed air. The compressor is shown in the accompanying engraving, which shows the plant in section, with plans of the head-piece, pipe and air chamber.

In the Taylor system the air is compressed by the direct action of falling water without the aid of any moving machinery, and practically without expense for maintenance or attendance, after installation. The water is conveyed to the compressor by means of an open flume, or, as shown in the diagram, through a pipe supplying a tank or stand-pipe round the head-piece of the compressor, where it can attain the same level as the water in the dam or source of supply. Around the head-piece are placed a large number of small horizontal air-pipes, drawing their supply



THE TAYLOR HYDRAULIC AIR COMPRESSOR.

of air through large, vertical pipes, which extend above the surface of the water and are open to the atmosphere. As the water enters the down-flow pipe, and passes the ends of these small air-pipes, it draws in the air constantly, in the form of small uniform globules, which, becoming entangled in the descending water, are carried down to the air-chamber, at the bottom of the pipe; compressing the air by weight of the water surrounding these globules, according to their depth below tail-race water level, until they reach the point of separation. The pressure on the air is then maintained, so long as any air remains in the air-chamber.

The receiver or air-chamber at the bottom of the compressor is sufficiently large in diameter to allow the air to rise to the surface of the water therein; from thence it is taken through the air-pipe for transmission, to be utilized as power or for other purposes. Should the volume of air taken down be greater than that being used, it accumulates in the air-chamber until it forces the water below the lower end of the receiver and the surplus air passes up with the return water, thereby forming a perfectly automatic safety valve, without change of pressure.

The material used in the construction of the down-flow pipe need only be of sufficient strength to carry the weight of water, and pressure of the working head of the water, as when once it reaches the tail-race level, the internal pressure is counteracted, from that point down, by the external

pressure of the return water, so that any compression of air may be obtained without increasing the strength of the down-flow pipe. The material for the down-flow pipe may be of iron, or wood hooped with iron, and the shaft may be constructed of a cheap grade of timber; and as the timber is preserved by being constantly in the water there is practically no limit to its durability.

By reference to the diagram it will be noticed that the head-piece is telescoped into the down-flow pipe and raised by means of a hand-wheel on top, to permit of its being regulated, so as to furnish from one-third up to its full capacity, using water proportionately with a like efficiency; or the head-piece can be raised above the water level and the flow of water stopped. By means of side screws or bolts the area of the inlet to the down pipe may be increased or diminished so as to regulate the speed of the water past the end of the air-pipes and can then be fixed permanently at the most efficient working point. At the bottom of the down-flow pipe is an upright cone which turns the course of the water toward the circumference of the air-chamber, thus facilitating the escape of the air from the water, while round the circumference, to turn the course of the water back toward the center, as indicated by arrows, is a deflecting apron, under which any air then in the water is caught and conveyed through a small pipe to the main body of air in the air-chamber.

A remarkable feature of this system is, that notwithstanding that the air is compressed by the weight of the water and in actual contact with it, the air so compressed is delivered in the air-chamber and thence to the transmission pipe, drier than when drawn in from the atmosphere. The power of the water may be turned into compressed air (giving a constant supply) at any pressure per square inch, with, it is claimed, less loss of energy than by any other means of transforming a water power into transmittable force, and with an unvarying steady pressure. By this compressor, it is also claimed low falls, otherwise useless, can be utilized, and the same pressure obtained as from high falls, the horse power being determined by the diameter of the down-flow pipe, and the height and volume of water in the fall, while the pressure depends solely upon the depth of the well or shaft; therefore, any desired pressure can be obtained.

The cost of the Magog plant was rather high, chiefly because of quicksand and other difficulties encountered in sinking the shaft. An estimate given by Prof. John T. Nicholson, of Montreal, is that, under ordinary circumstances, a large plant, including dam, could be put in for about \$30 per horse-power.

The pressure of the air in the chamber is measured by the difference of level between the surface of the water in the chamber and that in the tail race. In the Magog compressor the average water column measures 120.5 ft., which is equivalent to a gauge pressure of 52 lbs. The diameter of the water-supply pipe is 5 ft. 6 in. The diameter of the tank at the inflow is 12 ft. The diameter of the head-piece carrying the air tubes is 4 ft. 8 in. The internal diameter of the downflow pipe, 3 ft. 8 1/4 in. The air compressing chamber has a diameter of 17 ft. and an average height of 6 ft. from the base of the downflow pipe. The following table shows the results of tests made at Magog on August 7th and 13th last by Prof. C. H. McLeod, of McGill University, in Montreal:

RESULTS OF TRIALS OF TAYLOR HYDRAULIC AIR COMPRESSOR AT MAGOG, P. Q.

No. of trial	Quantity of water discharged in cubic feet per minute.	Available head in feet.	Available horse power.	Quantity of air delivered in cubic feet per minute at atmospheric pressure.	Pressure of air in compressor.	Actual horse power of compressor.	Efficiency of compressor.
1	6,122	21.4	247.7	1,377	52	132.5	53.5
2	5,504	21.9	228.0	1,363	52	131.0	57.5
3	4,105	22.3	168.9	1,025	52	105.3	62.4
4	7,682	21.1	305.9	1,616	52	155.4	50.8
5	6,312	21.7	267.0	1,506	52	144.8	55.7
6	7,494	21.2	299.8	1,560	52	150.2	56.1

NOTE.—Temperature of external air varied from 75° to 83°; of water from 75° to 80°; of compressed air from 75° to 80°.

Professor McLeod's report says that the column "available horse-power" gives the horse-power actually expended by the falling water on the air compressor and column "actual horse-power," the horse-power of the compressor. The efficiency is the ratio of the actual compressor horse-power to the horse-power available in the water-fall. He adds, in concluding his report: "It will be seen that the efficiency varied from trial to trial, and that where the quantity of water used was small, the efficiency was large. It will also be observed by comparison of trials 1 and 5, in which cases the quantities of water used were nearly the same, that the efficiency was greater in the latter case. This was owing to the fact that improvements were made in the details of the compressor in the interval. The temperatures taken show that the air was isothermally compressed, which is a very marked advantage of this compressor, as mechanical compressors lose a percentage by heating the air during compression, such heat being afterward wasted if transmitted to any considerable distance through a pipe line.

"Taking the most favorable conditions of working in this experimental installation as being the fairest estimate for probable future plants, the efficiency is seen to be 62%. The very marked increase of efficiency with the use of a relatively small quantity of water points clearly to the possibility of an increased efficiency in future installations. It ought also to be mentioned that in a comparison which was made, when the compressor was working at nearly its full capacity, of the amount of air taken into the compressor at the air inlets with that discharged from it, it was found that there was a loss of about 20%. This accounts for the smaller efficiencies obtained when large quantities of water were used, and shows that if this loss can be made good an efficiency of at least 60% will be obtained under all conditions of working."

This seems to be an development and application of the same principle which was used in the hydraulic blower of the old Catalan forges. This does not detract at all from the merit of the inventor who has worked out the application and put it into practice on a commercial scale. The usefulness of this plant at many mines can readily be seen, and in fact it is in mining work that it might be applied to the best advantage.

## ALEXANDER TRIPPEL.

Dr. Alexander Trippel, whose sudden death on November 26th, at the Astor House, New York, was briefly noticed in the columns of this *Journal* of November 28th, was a well-known mining and metallurgical engineer, who had been identified with the development of the mineral wealth of the United States for nearly half a century. He was born at Schaffhausen, Switzerland, January 25th, 1827, and was named for his grand uncle the famous Swiss sculptor and friend of Goethe. In the schools of his native town he early showed special aptitude for the study of chemistry, mineralogy, geology and the kindred sciences, to which he gave great attention. Emigrating to the United States about the time of the discovery of gold in California, he was soon engaged to erect sulphur works at Bergen Point, N. J., then owned by the White Brothers. His improved methods of making flower-sulphur attracted much attention. This employment was the introduction to a career of great activity. Between the years 1858 and 1863 he was engaged in smelting the copper ores at Ducktown, Tenn., where his successful reduction of the refractory sulphides of that region gave him a deserved prominence among the workers in copper.

In the year 1864 he was engaged in building rolling mills for zinc at Bethlehem, Pa., where he introduced valuable improvements in rolling zinc plates. He subsequently established a chemical and consulting laboratory at No. 18 Exchange Place in New York, where he continued for some years. From New York he went to the zinc region of Arkansas and was engaged in mining zinc ores. His next chosen field of labor was in the extreme West, particularly in Idaho, Nevada and Arizona, where his attention was given chiefly to the metallurgy of silver and copper. He erected silver mills at Lone, and introduced the lixiviation of silver at the Knickerbocker works. In 1872 he was placed in charge of the Manhattan silver mills at Austin, Nev. In 1878 he was superintendent of the Danville, Nev., silver mines, and from 1879 to 1881, of the Morey silver mines, Morey, Nev. We next find him engaged at the copper mines at Boleo, Lower California, upon which property he made extended reports. In 1882 he assumed charge of copper mines in the Santa Clara province, Cuba, and from that place went to the copper districts of Globe, Ariz., and held the position of metallurgist to the Old Dominion Copper Mining Company, and in 1884 became the superintendent of that company's operations there. While there he opened up rich ore bodies, before unknown, under the capping of lava rock, and redeemed much of the unprofitable experience of the company. Under his management the successful smelting of the ores of Globe was achieved, notwithstanding the enormous cost of transportation of the coke and products. He resigned this position in 1888 and devoted his attention to mining on his own account, but in 1890 he accepted the superintendency of the Buffalo Company's property in Globe, where he opened up new bodies of ore and worked them with success. In 1893 he became superintendent of the Phoenix Gold Mining Company's property on Cave Creek, Ariz., but soon resigned to devote his energies to horticulture in the Salt River Valley, and planted an extensive almond orchard at Mesa. But he could not long resist the fascinations of mining and took charge of the copper properties at Rosemont in the Santa Rita mountains near Tucson, and was connected with them as superintendent at the time of his death.

He left Tucson in November in perfect health to go to New York on business of the Rosemont Company. He there contracted a severe cold, which, in a few days, developed into pneumonia and terminated his life at the age of 69 years.

Dr. Trippel was exceedingly genial, a conscientious and careful worker and a man of great industry in disposition. His warm and affectionate nature prompted him to render assistance in counsel or money to the needy and deserving. He was an ardent and patriotic citizen, having been naturalized as soon as possible after coming to the United States, and at all times he took a keen and lively interest in public affairs. For several years he was a regular contributor from Arizona to the annual reports of the Director of the Mint, and other works upon the copper, gold and silver production of the Globe mining district. In his death Arizona loses an active worker in the development of its resources.

He leaves two sons, residents of Arizona, and one daughter, a resident of New York.

**Burnt-Clay Ballast.**—The Missouri, Kansas & Texas has been using burnt-clay ballast on certain portions of its line in the Indian Territory, and the success has been great enough to warrant its use on other portions of the line. Kilns are now being erected at Hillsborough, Tex., to burn the clay for ballasting portions of the Texas lines.

## A SAXON COAL MINE.

By E. R. Schoch.

In the annual report of the Anglo-American Club of Freiberg, the author says that typical mines of the Saxon coal-field are found in the Zwickauer Revier. One of the leading companies is the Zwickau-Oberhohndorfer Steinkohlen-Verein, which owns about 640 acres and has several shafts and coal-washing plants. The coal seams on this tract are traversed by one large fault striking from southeast to northwest with a dip of 60°. This fault raises the southern part of the field about 150 m. above the northern position. There are several smaller faults, all having nearly the same strike.

Three shafts have been sunk to work this property, two of which are used for haulage, while the third is used as an air-shaft and affords a safety outlet in case of accident. Of the two larger shafts the Wilhelm I. is the most important. This shaft in reality is a double shaft, having two divisions, of which the cross-sections measure 4.5 by 1.2 m. The shaft is bricked out and timbered, and is carefully inspected every week. The depth of this pit at present is about 400 m.; the shaft will be sunk much deeper, however, as there are seven workable coal seams, having a total thickness of about 25 m. All of the main levels are likewise bricked where they connect with the shaft, some of them for a distance of about 400 m. As one goes further into the levels the brickwork is replaced by iron framing and timber. In some parts of the mine there is very little or no pressure, whereas in other parts it is so great that wooden timbers 9 in. to 1 ft. in thickness are broken, and consequently the timbering has to be renewed every few weeks. The underground haulage in the main levels is done by means of endless ropes or chains, and the hoisting is done with air windlasses.

The method of coal getting is the pillar-and-stall work; in parts, the coal being loose, the getting is very easy, but again, in others, the material is almost like granite. In the Zwickau coal fields blasting is prohibited unless absolutely necessary; when this is the case, permission must first be obtained from the Government before it can be done. These regulations are the result of a few small coal dust and fire-damp explosions. The coal is of medium quality, being the so-called "Ru-s" and "Pech" coal, and contains between 5% and 10% of ash.

The ventilation is carried out by means of the ventilators commonly used all over Saxony in the coal mines, and is very satisfactory—so that explosions are of very rare occurrence. The temperature varies between 15° and 40° C. in different parts of the mine, these temperatures being fairly constant all the year round.

These mines being comparatively dry, very little pumping or drainage is necessary. In other mines in the immediate neighborhood large quantities of water are met with, necessitating large and costly pumping machinery.

The workmen are, as usual, divided into different classes, according to age and ability; the wages average between 1.50 marks and 3.00 marks a day (1 mark = 1 shilling = 24 cents.) These wages are either "Schicht-lohne" (shift wages) or "Gedinge-lohne" (tribute wages) according to the nature of the work. The schedule is so arranged that the amount earned is nearly the same in both cases—though the workman who is paid the tribute wage can usually, if he be skillful and energetic, earn a little more than the "shift" man.

The prescribed lamps are the safety ones of Wolf, manufactured in Zwickau, and used in nearly all Saxon and other German mines where safety lamps are needed. The Wolf lamps are fed with benzene and burn from 16 to 20 hours without refilling. They are self-lighters, and can only be opened by means of a strong magnet (kept in the lamphouse outside) thus making it impossible for the workman to open his lamp in the mine.

The shift is 10 hours, from grass to grass, except in places where the temperature exceeds 35° C.; here the workmen are relieved every five or six hours. Outside men work a 12-hour shift.

The Wilhelm I. shaft has two hauling engines. One of them is an old air compressor transformed so as to make it serviceable in its present capacity; it works with a flat cable, and is provided with a stopping gear to prevent overwinding. The other engine is of modern construction; it works with a round cable and has a Roemer stopping gear. The hoisting speed averages 10 m. per second, except when hoisting out the men; then the speed must not exceed 5 m. per second. The cages are provided with safety catches (Munzner pattern), two forked knives attached to the sides catching into the beams in case the cable should break. The cages are two-storied and carry one car in each story. Signaling is done with electric bells. The outside works are lighted by



ALEXANDER TRIPPEL.

electricity, there being 38 arc and 417 incandescent lights. The dynamo is run by a 75-H. P. Westinghouse engine. The dynamo itself has an electro-motive power of 60 H. P., supplying at 300 revolutions a current of 330 amperes and 120 volts.

The ordinary production is 22,000 metric tons a month in summer and 31,000 tons in winter. About 1,200 men are employed, besides a few boys and women who work in the coal-dressing plant. These plants are now indispensable at German coal mines, as it is not possible to sell run-of-mine coal. The plant at the Wilhelm I. shaft is nearly new and very complete. There are the usual repair and blacksmith shops, and also a battery of coke ovens.

#### AN ILLINOIS "SOLID-SHOOTING" MINE: THE VIRDEN SHAFT.

Written for the Engineering and Mining Journal by Our Special Correspondent.

This shaft, the property of the Chicago-Virden Coal Company, is situated within the limits of the town of Virden, in Macoupin County, Illinois, 60 miles northeast of St. Louis, on the Jacksonville & St. Louis and the Chicago & Alton railroads. The shaft is 8 x 16 ft. in size, 320 ft. deep, and has been in operation four years. As shown by the photograph the tower is very securely braced. In addition to the cross-bracing, the back-stays are spread at the bottom, adding greatly to their stability. There is no perceptible vibration when hoisting.

The shaking screens for separating the smaller sizes of coal, and the bins for storing it, are in a separate building, a space of 4 in. intervening between the building and tower. By this means another source of tower vibration is avoided.

As the coal comes to the surface it is dumped upon a 12 x 20 ft. diamond bar screen, having a 1½ in. space between the bars.

A flight of buckets 7 x 7 x 20 in. carries the screened coal from the large bar screen to two small shaking or oscillating screens. These two screens are 4 x 24 ft., and one is hung in the usual way, by iron bars ½ x 1½ in., while the other screen is set upon wheels. This latter method

entries 8 ft. The entry pillar is 40 ft. in width. Crosscuts are driven at distances varying from 60 to 75 feet. These crosscuts are generally stopped with a brattice of 1-in. pine boards. This method is cheaper than using other material, as slate and stone are not available. One foot of top-coal is left up in the cross or butt entries. As the work progresses this top coal falls and is loaded and sent out; very little of it is lost.

Cross-entries are not timbered. Rooms are turned at distances of 40 ft.; necks are 8 ft. in width and 15 ft. deep. The rooms are widened out right and left to a total width of 25 ft., and are driven to a depth varying between 170 and 180 ft.

The coal is blasted directly from the solid, no cutting being made. No slack or small coal is gobbled, all being sent to the surface. In other mines in this field gob-fires have been frequent, and this is a wise precaution. At this mine there is no waste heap on the surface, as all the smaller sizes of coal are marketed, and the slack and duff is burned out by the boilers. This is not usually the case in a mine making 40% of fine coal.

The hoisting shaft, 8 x 16 ft. in size, is used as an upcast. A fan 12 ft. in diameter is connected to the air chamber, 2 x 8 ft., on one end of the shaft. It is necessary to have ample provisions for ventilation in these solid shooting mines, as immense volumes of powder smoke are given off at firing times and these products of explosion must be driven from the working places as soon as possible. The intake air is split at the bottom of the down-cast into two main splits. It is the intention of this company ultimately to ventilate each pair of lateral or butt entries by a separate current of air, with an overcast and regulator for each pair of entries.

Main and cross-entries are driven very straight. The main entry tracks are laid with 20-lb. iron and cross-entries with 12 and 16-lb. iron. All haulage is by mules, of which there are 20 in use.

This mine formerly used squared cross-timbers, 8 x 12 in. in their main entries, but now use faced white and black oak timbers. Hewed timbers proved to be stronger, lasted longer, and were cheaper than sawed timbers.

The escape shaft is, in compliance with the Illinois mining law, 300 ft. from the hoisting shaft.



CHICAGO-VIRDEN COAL COMPANY'S MINE, VIRDEN, ILLINOIS.

gives satisfaction, and is believed to be entirely new. Three pairs of 14-in. mine car wheels connected by 1½ in. iron axles, are set under the screen and at right angles to the length of same. These three pairs of wheels rest upon 10 x 12 in. pine stringers, and support the entire screen. The pitmans, one on each side of the screen, are attached to the extremities of the axles. The eccentrics giving the oscillating motion to the screens have a throw of 8 in.

Steam is furnished by four tubular boilers 60 in. diameter by 16 ft. long. The hoisting engines are of the Litchfield pattern, are double and direct-acting, having 20 x 32-in. cylinders.

Russell & Parsons' self-dumping cages are used and can land between two and three cars per minute. The hoisting is done on the end of the shaft. This places the engines and boilers at one side and gives more room for supplies, repair shops, etc. When the shaft was sunk and tower erected it was the intention to load coal on two different lines of railroad, one on each side of the shaft, and it was for this reason that the hoisting engines were placed on the end of the shaft. At present, however, the cages land coal upon only one side of the shaft.

At the upper landing, immediately in the rear of the bar screen, the guides in the shaft, 4 x 8 in. pine timbers, are cut out on each side of the shaft for a distance of 10 ft. When the cage, in its ascent, reaches this point, there is no support for the cage shoes which run upon the guides, the platform tilts over, carrying the loaded car with it, the cast-iron projection upon the side of the cage catches the plate upon the tower floor, a large iron hook engages the end-gate of the car, and the coal slides out upon the screen. When this operation is completed the top man gives the hoisting engineer a signal, the cage settles back into the guides and returns to the shaft bottom; arriving at the bottom the cage sinks into a sump 6 ft. in depth, the weights upon the ends strike upon metal bearings, the dogs fall outward, releasing the car wheels and the empty car is bumped off the cage by the tulle one.

The vein of coal is from 7½ to 8 ft. in thickness. The coal is clean and blasts from the solid very easily. Room and pillar by double entry is the method of mining. Cross entries are driven from the main entry at distances of 400 ft. Main entries are driven 12 ft. wide and cross or butt-

There are 260 miners employed in this mine, and the price paid for mining is 55c. per net ton over a 1½-in. screen. The price paid for yardage is \$1.25. Room-tuning is not paid for. At this mine the daily capacity is 1,800 gross tons of coal.

#### THE BITUMINOUS SHALES OF NEW SOUTH WALES.

New South Wales, according to a recent article in the *Australian Mining Standard*, is now the only country producing bituminous shales of high quality. The shales which are at present mined in the colony yield from 50 to 150 gals. of oil to the ton, while those worked in Scotland give only 20 to 40 gals. In New South Wales the area in which shale is found is large, there being a belt of country about 250 miles in length, where isolated deposits occur, the best known being Joadja Creek, Katoomba, Megalong Valley, Hartley Vale, then crossing the Blue Mountains, Marangaroo and Capertee; and further still, north of Mudgee, the Baragon and Reedy Creek deposits, and still further on to Murrumbidgee. The deposits of shale, where they occur, are easily found, as 120 ft. above them is a useless, dirty seam of coal. The shale is found in small isolated seams, which are all upon the same horizon. The references following are only to those deposits which have proved to be of commercial value. Seams of 6 in., even of high quality, are too expensive to work at a profit, while the lower class of shales are practically of no value.

The best known deposits are those worked by the Australian Kerosene Oil and Mineral Company, at Joadja and Katoomba, and the New South Wales Shale and Oil Company, at Hartley Vale. These deposits have now been worked for over 30 years, and their early exhaustion is predicted. The Joadja seam has produced possibly the highest grade shale known in the world, but that exceptional quality is now a thing of the past. The seam at Hartley Vale was the thickest known producing high-class shale. This deposit was worked in the ranges on the opposite sides of the valley by tunneling, when it was found that the seam was in the valley also, having been faulted above.

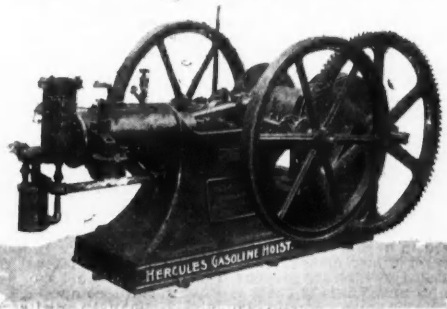


The Genowlan seam having been worked by one company with but little success, was taken on an option by the Australian Kerosene Oil and Mineral Company, but the extent and quality of the deposit has not proved sufficient to induce the company to purchase the property. The New South Wales Oil and Mineral Company bought the Kings mine to increase its supplies.

A good deal of prospecting has been done, but at the present time there is only one seam known that is likely to prove equal to supplying the market, and that is situated in the table-land in the parish of Gindantherie, between the Capertee and Wolgan rivers. This deposit has been opened up by the Capertee Kerosene and Oil Mining Company, which met with exceptional difficulties in obtaining the shale, the main tunnel being unfortunately started in broken ground, so that it was necessary to drive 1,000 ft. before meeting the marketable shale unaffected by the weather. This seam has been proved to be the largest deposit at present known. Five square miles, with a frontage of two miles to the Capertee River, and extending 2½ miles back to the Wolgan River, has been proved by various prospecting and developing works. On the north, or Capertee side, the principal work has been done. Commencing on the east a shallow shaft shows the seam. Various outcrops show till the main tunnel is reached, which is midway between the east and west boundary, and has been driven 1,100 ft. all in shale. A quarter of a mile to the west is a short tunnel of 40 ft.; and in another quarter of a mile another of 160 ft., and on the boundary is a trench showing the shale. On the southern, or Wolgan, boundary there is a tunnel, and various outcrops showing for 1½ miles down stream. The continuity of the seam through the whole of this area is undoubted, and receives official confirmation in the records of the Geological Survey, where it is stated that the prospecting done in 1894 "practically proves its persistence under the whole of the table-land in the Parish of Gindantherie, between the Capertee and Wolgan rivers."

The size of this seam is, at its thickest, 3 ft. 5 in. to 3 ft. 7 in., but runs about 3 ft. Of this there are 23 to 23 in. that will average over 65% of volatile hydro-carbons, or 13½ in. that will average over 70%, or rejecting 4 in. at the bottom of the seam, the remainder will average 62%, the highest assay being 81.5%. Under the shale there is a layer of sandstone, which will be of use in packing to support the roof, and below that 20 in. of good steaming coal, which will give good hoisting for the miners and enable the shale to be mined at a cheap rate, while the coal will be of value for distilling the shale and as fuel for the engines.

The profits on shale are made from its sale to gas companies, which use it to improve the illuminating power of the gas. There is also



A GASOLINE HOISTING ENGINE.

some profit in the distillation of oil for sale, and there are works for that purpose at Joadja and Hartley Vale, where kerosene oil and paraffine candles are made. Neither of these plants, however, is equipped with the latest improvements.

The business is at present rather a close one, and none of the companies make any statement of costs or profits; but it is supposed that the profits are considerable, as the expense of mining is not high.

#### THE GASOLINE ENGINE FOR HOISTING AND PUMPING.

Among the many uses to which the gasoline engine is being adapted is hoisting and pumping in mines. A few years ago the practical miner looked askance at a gasoline engine, but continued success and the demonstration of its convenience and economy have changed this altogether and they are coming into use very rapidly in mining work. The accompanying cut shows the small space occupied and the simplicity of the hoist illustrated, which is one built by the Hercules Gas Engine Works, of San Francisco. When started, which is done by one revolution of the fly-wheel, the engine consumes only a fraction of a gallon of gasoline per hour. While a load is being hoisted, the governor automatically increases the amount of gasoline until sufficient is fed to give full power. As the time required to start engine from a stand-still is only 20 seconds, many engineers, where the hoisting is done very intermittently, stop the engine between loads. When the engine is doing full duty, the consumption of gasoline is not to exceed ¼ gallon per horse-power hour.

Engines of the type shown are built from 4 H. P. to 35 H. P., larger sizes, up to 200 H. P., being of the vertical double-cylinder type.

For the last 15 years this engine has been in successful use, 3,000 having been manufactured by the builders, who were the first to apply gasoline engines for hoisting and general mining purposes.

At the present time these engines are in use at mines in California, Nevada, Arizona, Colorado and Utah.

**Iron Production in Belgium.**—The production of the Belgian blast furnaces in October was 94,860 metric tons, showing an increase of 25,065 tons, or 35.8% over October of last year. For the 10 months ending October 31st the output was 802,556 tons, the increase being 110,991 tons, or 15.8%, as compared with the corresponding period of 1895.

#### SOME APPLICATIONS OF COMPRESSED AIR.

Compressed air is rapidly widening its field of usefulness in mill and shop work. An air compressor is becoming as important a feature in the equipment of machine shops, foundries, stone works and factories of all kinds, as a steam engine or water pump, and tools or appliances driven by compressed air are decidedly necessary in any shop or factory interested in labor-saving methods. In milling work and in mines its uses are well known, but might be greatly extended. To those already using compressed air, little need be said regarding the saving in time and labor accomplished by the use of pneumatic tools, drills, hoists or other appliances. As a method of storing, transmitting and applying power it presents many advantages, upon which it is not necessary to enlarge here.

In many cases, as with pumps and hoists, the air can be used directly in the power cylinder, but in others there may be some doubt as to the most convenient method. The accompanying illustration shows a very convenient type of engine designed and built by the Clayton Air Compressor Works of New York, for applying compressed air where needed. This engine is desirable for operating tools at remote points in shops equipped with compressed air, dispensing with pulleys, hangers, shafting, belts, etc. A wide range of adaptability is sometimes secured by mounting it on wheels and moving it from one point to another, as may



THE CLAYTON COMPRESSED AIR ENGINE.

be required. It can be connected with the air supply pipe by means of flexible hose, and being self-contained, is always ready and reliable in operation. The engine is built almost entirely of steel, to insure strength and portability. The size of the engine shown is 3 in. diameter of cylinder, by 4-in. stroke. It can develop 1½ H. P. Larger size, can, of course, be used when needed.

**Demand for American Tin-plate in Switzerland.**—Consul Ridgely writes to the State Department from Geneva, November 13th, 1896: "There is evidence of at least a small demand in Geneva for American tin-plate—that is to say, for the raw material packed in boxes; also, for black sheets packed in bundles. If any American manufacturer of this material will send, as early as possible, price list and terms to me, I will endeavor to put them in the hands of at least one intending purchaser."

**Japan Relinquishes Manufacturing Privileges in China.**—Minister Denby, under date of Peking, October 20th, informs the Department of State that the Japanese government, on October 16th, officially and formally renounced that part of clause 4, Article VI., of the Shimonoseki treaty between Japan and China at the close of the recent war, which provides that all articles manufactured by Japanese subjects in China shall, in respect of inland transit and internal taxes, duties, charges and exactions of all kinds, and also in respect of warehousing and storage facilities in the interior of China, stand upon the same footing and enjoy the same privileges and exemptions as merchandise imported by Japanese subjects into China.

**Mines of the Argentine Republic.**—Under date of Buenos Ayres, October 9th, 1896, Minister Buchanan reports to the State Department, as per information received from the Director of the Department of Mines and Geology that, according to the most reliable data his department had been able to secure, there were taken from mines in the Argentine Republic during the last year 47 kg. of gold, 10,210 kg. silver and 389,900 kg. of copper. The countries to which this output was exported were Germany, France, Belgium and Italy. It is confidentially believed, however, by the director that the mineral output of the country was very much greater during the past year than the above figures would seem to indicate. Constant efforts are being made to locate new and profitable mining possibilities in many parts of the Andes and a renewed interest in mining is being manifested on every hand.

## ASPHALT IN MEXICO.

In a recent report to the State Department Vice-Consul Bielenborg, at Matamoros, Mexico, says: "Long before taking charge of this consular office, a Mexican land owner called my attention to the resources of his land, which he claimed to be petroleum, and, upon my request, he forwarded samples to me. I had them analyzed in the State University of Texas, which pronounced them very rich as a natural mineral tar, but not petroleum. I concluded to make a trip to the land, and last June I started with Mr. W. S. Scott, of California, to accompany me and investigate. Our trip was very tiresome, over a hard road of about 300 miles, through a country very little settled, until we reached the ranch, where we found one of the richest asphalt fields known and about 20 wells, which have a continuous flow of mineral tar, as the analysis calls it. The ground for over 20 miles square is covered with asphalt deposits. The near-by streams have the whole year round a fatty, oily substance flowing into them from the surrounding mountains, making the water unfit to drink. From all indications there must be a large deposit of petroleum and coal under this asphalt field. I was instrumental in obtaining from the owners a concession for the working of these fields for 50 years, and a company is now being organized in the United States to commence work, put machinery on the ground and drill for oil. Besides opening up a market in the United States for the sale of asphalt on a large scale, the land being situated near the coast line in the district of Sota de la Marina, transportation can be effected by water. The River La Marina flows through the land and is navigable for vessels of 30 tons capacity."

## RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

**DUTY ON STEEL WIRE CLOTH.**—The wire used in making said cloth was of a value exceeding 4c. per pound. Duty was assessed upon the cloth at 40%, and in addition thereto 1c. per pound, under paragraph 124. Appellants claimed that the 40% should have been assessed upon the value of the wire only, and in addition thereto 1c. per pound upon the cloth. The protest was overruled.—The J. F. McCoy Company, appellant, vs. Collector of the Port of New York United States Board of General Appraisers.

**DUTY ON FERRO-CHROME.**—In this case ferro-chrome was assessed at 20% under Section 3. The protest claimed the article to be free as chromate of iron, under paragraph 438, or dutiable at 10% under Section 3, or by similitude at 3½% per ton under paragraph 110, the last being the only claim pressed at the hearing. The Board held that the merchandise is not chromate of iron, nor a crude article, and that it is not similar to the article named in paragraph 110. The protest was overruled.—Dana, appellant, vs. Collector of the Port of New York; United States Board of General Appraisers.

**Wolframite in Arizona.**—Prof. Wm. P. Blake, Director of the Arizona School of Mines, reports the occurrence of wolframite, or tungstate of iron, at several localities in the southern part of Pima County, Ariz., particularly in the Arivaca mining district, where it is associated with gold-bearing quartz. This occurrence of an ore of tungsten in auriferous quartz veins is rare and unusual, but has been before noted by Professor Blake at Murray, Idaho, where there is a vein of tungstate of lime, or the species scheelite, alongside of a gold-bearing quartz-vein.

**A Railroad Without Cars.**—In the forest of the Bridal Veil Lumbering Company, at Bridal Veil, Oregon, not far from The Dalles, there is a railroad which does business without cars. An article in the *Northwestern Lumberman*, describing the work of this company, has a picture of a "train" on the road, which consists of an ordinary locomotive such as are common on logging roads, and a string of logs, each log being as large in diameter as the boiler of the engine, or larger. Boards are nailed to the sleepers between the rails and on these the logs slide. Except on descending grades, the boards are greased, and the train moves at good speed. Where the road is level or slightly ascending the engine pulls the logs, and where it is descending it holds them back. At the mills of this company the manufactured lumber, regardless of size, is run into a flume and this is carried about two miles to the planing mill and shipping yard, the flume descending in that distance about 1,300 ft.

**A Fresh Development in Connection with Colliery Strikes.**—The strike of 1,200 men and boys at the Wharfedale Silkstone Colliery, between Sheffield and Barnsley, opens up a new kind of warfare in connection with colliery strikes, says the *London Engineer*. Owing to the low price of fuel, and the difficulties which have for some time attended the sale of thin-seam coal, the management gave notice to 212 men and boys employed in the East Parkgate Seam, and closed the same. The miners employed in other seams belonging to the same company protested, and urged that the firm had ulterior objects in view, and finally balloted in favor of leaving work. The result of the voting was made known to the Council of the Miners' Association, who gave the men permission to appeal to the various miners' lodges throughout the country as to whether they should tender their notices and leave work. The answer was in the affirmative, and the men tendered 14 days' notice and left work on Tuesday, thus practically closing one of the largest pits in South Yorkshire. The management have issued a notice stating that of the 212 men discharged, 81 have found work in other seams, 29 have obtained work at other pits, and work can be found for others, which will reduce those out of work to 21. The strike, it is said, will cost the Miners' Association £1,000 per week. It will tend to impoverish the district, and may be of some duration, inasmuch as it is stated the owners will be financially assisted from the coffers of the Coal Masters' Association.

**Bricks from Blast-Furnace Slag.**—The manufacture of brick from blast furnace slag is being successfully practised by the Bohemian Mining Company at the Karl-Emil works, in Bohemia. How the consumption of this kind of brick has increased is best shown by the increase of production, which rose from 200,000 bricks in 1888 to 12,100,000 in 1895. In the Karl-Emil blast-furnaces limonite of the Bohemian sub-ilurian formation is worked by means of coke, whereby slag of the following composition is produced: Silicic acid, 25.8 to 27%; peroxide of iron, 1.7 to 1.5%; clay, 17.3 to 19.3%; lime, 51.4 to 51.5%; magnesia, 2.5 to 0.4%; sulphur, 1.3 to 1.8%. This slag, mixed in granulated condition with caustic lime, hardens to a cement-like mass, from which the so-called slag brick is produced. Such a brick weighs about 10 lbs. and can theoretically bear a burden of 35 lbs. per square centimeter. The production of these bricks is at the rate of 1,000 per hour. After having dried eight days the bricks are ready for shipment. The hardening process is accomplished by the silicic acid of the slag combining with the lime additions that are made during the process of manufacture, and the hardening of the latter itself by absorption of carbonic acid. The works mentioned also use spathic ore, which produces a dark colored slag. Dark slag, however, has not proved as suitable for the manufacture of brick as the light-colored slag, because its lime content is lower, and for this reason a larger addition of lime is required for producing a batch of the proper consistency. Besides, brick from dark slag has to be dried for about three months before it is hard enough for shipment.

## PATENTS RELATING TO MINING AND METALLURGY.

United States.

The following is a list of the patents relating to mining, 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 Scientific Publishing Company upon receipt of 25 cents.

WEEK ENDING DECEMBER 15TH, 1896.

- 572,969. **COMPOSITION FOR FIRE-BRICK.** Karl H. Dangler, Steubenville, Ohio. A composition consisting of 600 parts clay, 300 parts ground white sandstone, 40 parts crystal sand, 25 parts fluor-spar, and 35 parts calc-spar.
- 572,973. **WELL-DRILLING MACHINE.** Lorenzo D. Ennes, Lyons, Ind., Assignor to Carrie C. Ennes, same place. The combination of a revolving loosely-mounted frame carried by wheels or cranks and provided with sheaves between which the ends of the walking-beam pass.
- 572,991. **CHAIN.** Lyman D. Howard, Philadelphia, Pa., Assignor to Joseph A. Jeffrey, Columbus, Ohio. The combination with a chain-link having a socket with a relatively narrow transverse throat, and a spherical bushing adapted to be inserted in the socket through the throat when in a non-working position, and the bushing having a recess, of an adjacent link having an end by adapted to be inserted in the recess through the throat while its link is in a non-working position relative to the first link, whereby the end bar and the bushing are secured in the socket when the last link is turned into working relation to the first link.
- 573,039. **APPARATUS FOR MAKING CHLORINE.** Samuel A. Sadler and Robert H. Wilson, Middletown, England, Assignors by mesne assignments to the American Alkali Company, Limited, London, England. An apparatus comprising the acid supply vessels, a series of mechanical feeders operated in unison to supply the required relative proportions of the different liquids, means for operating the mechanical feeders, a decomposer to which the measured quantities of acid are delivered, and means for purifying the gases evolved in the decomposer.
- 573,041. **ELECTRIC FURNACE.** Martin Schindler, Neuhausen, Switzerland. In apparatus for melting or fusing by electricity, a holder for the positive electrode consisting of a clamp composed of two independent sections, each provided with a half seat or bearing for the electrode and with a continuous circulating channel or passage having inlet and outlet, and clamping bolts for clamping the sections together.
- 573,140. **CALCINING FURNACE.** August Dauber, Bochum, Germany. Patented in Germany, March 17th, 1892, No. 68,276; in France, June 15th, 1892, No. 222,351; in Belgium, August 12th, 1892, No. 100,921; in England, September 5th, 1892, No. 15,880; in Italy, April 10, 1893, No. 33,735, and in Austria-Hungary, May 13, 1893, No. 7,461 and No. 49,852. In a furnace for continuously calcining and roasting limestone, cement, gypsum, dolomite and like materials, the combination with a conical shaft, a base supporting the shaft pillars upholding the base, radial girders, a ring-girder, a delivery-cone supported by the girders, lanterns, a closing cap and a table with valves arranged therein below the cone.
- 573,142. **METHOD OF AND MEANS FOR REMOVING PARAFFINE FROM OIL-WELLS.** Francis A. Flanegan, Washington, D. C. The method consists in heating a paraffine solvent, circulating the solvent in the well and its crevices, thereby dissolving the paraffine by contact with the hot solvent and removing the solvent and contained paraffine from the well.
- 573,163. **AMALGAMATOR.** John A. Ruffe, Denver, Colo., Assignor of one-sixteenth to James Higon, same place. The combination of a casing or sluiceway having a series of pockets at intervals in the length of its bottom, deflectors located in advance of the pockets and curved plates arranged in the rear of the pockets and considerably higher than the deflectors.
- 573,185. **FEED-TABLE FOR ROLLING MILLS.** Sigmund V. Huber, Pittsburg, Pa. The combination of a plate for receiving an article from the rolls, two or more series of positively-driven rollers for feeding the article to the rolls, an adjustable apron for directing the article from the plate to either series of feed-rollers and means for pushing the article laterally from the plate to the apron.
- 573,204. **STEAM SHOVEL.** Jeremiah Campbell, Chelsea, Mass. The combination of the steam shovel, an opening and closing drum, a hoisting-drum, an opening and closing rope extending to the drum, a hoisting-rope extending about the drum over the pulley, and a weight carried upon rope between the pulley and the point of attachment.
- 573,237. **COMBINED COAL-CUTTING AND DRILLING MACHINE.** Samuel Raybould, Nelsonville, O. The combination of a drill-supporting frame comprising a horizontally-adjustable portion carrying a vertically-arranged idler-gear and a horizontally-arranged driving-gear meshing with each other, the axis of the gear being at the axis of frame portion and the gear adapted to engage and be driven by the power-shaft of the cutting-machine, and a drill-carrying frame portion pivoted to swing vertically on portion and at the axis of gear thereof and having the gear with its axis at right angles to the axis of the portion and meshing with gear.
- 573,271. **COAL-MINING MACHINE.** Joseph M. Housholder, West Elizabeth, Pa. The combination of a sprocket-chain having links provided with outer saws or cutting-teeth, and alternate links composed of saws spaced apart by intermediate blocks, the latter saws being located in the plane between the saws of the other links.
- 573,377. **PROCESS OF CONSUMING HYDRO-CARBON GAS.** Thomas L. Willson, New York, N. Y., Assignor to the Electro-Gas Company, of West Virginia. The process consists in forcing a small stream of acetylene gas through a burner, whereby the acetylene in burning is enabled to appropriate the full amount of oxygen required for its combustion before cooling below its kindling temperature.

## PERSONAL.

MR. FRANK BILVINGS, son-in-law of the late John Tod, has been elected general manager of the business of the firm of Tod, Stambaugh & Company, Cleveland, O.

MR. WILLIAM A. CLARK, the well-known mine owner and financier of Montana, is now in New York on business. He will shortly go abroad to remain in Paris and London for some months.

MR. CHARLES MCINTOSH, the present Lieutenant-Governor of the Northwest Territories, Can., and who has become largely interested in Trail Creek mining properties, intends at the close of his term of office to locate permanently in Rossland.

MR. GEORGE PFUNDFR, the original locator of the Morning Star mine, in Trail Creek, and one of the chief promoters of the Morning Star Mining Company, has returned to Rossland, B. C., after an extended trip to Buffalo, Syracuse, Detroit, Toronto and Montreal.

DR. PETER MUSSIGBROD, a mine owner of Warm Springs, Mont., was recently in New York on business. New mineral properties in Montana are being rapidly prospected, and the coming year will doubtless see a very large addition made to the list of gold mines in operation.

MR. C. F. ARNOLD, secretary of the Montana Consolidated Mining and Milling Company, has been given an option on the Golden Gate mine, in the Cable District, Mont., for \$15,000, and has gone East to enlist Ohio capital in the mine, and, if possible, capitalize the new company at \$25,000.

MR. E. GYBSON SPILSBURY, managing director of the Trenton Iron Company, will sever his connection at the close of this year and, temporarily at least, resume practice as consulting engineer. His address in New York, until more definite arrangements are made, will be No. 13 Burling Slip.

MR. W. S. HASKINS, late superintendent of the Jumbo mine, has severed his connection with that company and has taken charge of the Homestake, Maid of Erin and R. E. Lee Syndicate group, in Trail Creek, B. C. This work he was temporarily performing while attending to his duties at the Jumbo mine.

## OBITUARY.

R. T. DODSON, superintendent of the Blossburg Coal Company's mines at Arnot, Tioga County, Pa., died December 21st of paralysis, aged 54 years.

ALEXANDER C. LONG, aged 47 years, died December 20th, at Irwin, Pa. He was prominent in manufacturing circles, having built most of the plate glass plants of the country. He was manager of the Pennsylvania Plate Glass Works, of Irwin.

COL. WILLIAM C. STILES, of Volcano, W. Va., known for years as the "Volcano Oil King," died at his home December 17th. He was born in Philadelphia in 1839 and went to Volcano in 1868 as superintendent of the Volcano Oil and Coal Company, of Philadelphia, of which his brother, Harry Stiles, was president.

H. T. MORRISON, superintendent of the Petersburg Iron Works, died at his home in Petersburg, Va., on December 6th. He was a son of the late Dr. Morrison, of Brunswick County, and an expert machinist. He at one time resided in Massachusetts. The works of which Mr. Morrison was superintendent has a large contract for furnishing the government with munitions of war.

ROBERT READ died December 9th at his home in Baltimore, Md., aged 77 years. In 1849 he went to California, and spent some time there during the gold fever. Returning to Baltimore, about 1861, he built one of the largest coal-oil refineries in Baltimore, and engaged in the oil business. About 13 years ago he sold the plant to the Standard Oil Company, took a position with it as purchasing agent, which he held until his death. He was also a director of that company.

CHARLES O. SHIELDS, a well-known mining engineer, of Denver, Colo., died recently in Uyuni, Bolivia. Mr. Shields went to Colorado in his childhood. He was a graduate from the State School of Mines, and became one of the firm of Shields & Middleton, mining engineers. He was quite extensively interested in Cripple Creek mining properties. He sailed from New York in August for South America in the interests of the American Development Company of New York, his destination being Sucre, the capital of Bolivia.

ISAAC R. MOISTER, division superintendent of the Lehigh Valley Coal Company, died December 18th, at Wilkes-Barre, Pa., of typhoid fever. He was born in Pittston, in 1859, and learned engineering and served his apprenticeship at Lost Creek, with the Lehigh Valley Coal Company's engineering corps. He afterwards took charge of the State Geological Survey in the Hazleton District, and after two years in this capacity returned to the Lehigh Valley Coal Company's employ as division engineer, going to Wilkes-Barre in 1888, and advanced to the responsible position of division superintendent.

## SOCIETIES AND TECHNICAL SCHOOLS.

ENGINEERS' CLUB OF ST. LOUIS.—The 445th meeting was held December 16th, 1896, at the Southern Hotel, the occasion being the annual dinner, after which President Ockerson announced the result of the election of officers for 1897 as follows: President, Edward Flad; vice-president, William H. Bryan; secretary, Richard McCulloch; treasurer, Thos. B. McMath; librarian, Julius Baier; directors, J. A. Ockerson and B. H. Colby; members board of managers of the association of Engineering Societies, J. B. Johnson and E. A. Hermann. The new president, Mr. Edward Flad, was introduced and presided during the remainder of the evening. President Ockerson introduced the following resolution which was unanimously adopted: Resolved, That the thanks of the club be tendered Mr. William H. Bryan for his faithful and efficient manner in which he has discharged every duty devolving upon him as secretary during the past three years. Mr. B. H. Colby then responded to the toast "The Municipal Engineer." Mr. E. J. Spencer spoke on the "Production and Distribution of Electricity." Prof. W. S. Chapin discoursed upon "The Engineer in the Orient." Mr. R. E. McMath addressed the club on "Civil Service in Municipal Affairs."

## INDUSTRIAL NOTES.

Pickands, Mather & Company and E. C. Pope & Company, iron ore firms of Cleveland, O., will be consolidated on January 1st, 1897.

The Addyston Pipe and Steel Company, of Newport, Ky., will start up its plant after an idleness of eight months, employing 125 men.

The Greensboro Steel and Iron Company has leased the iron mine at Chapel Hill, N. C., and will use this ore, which is very high class, in its furnaces.

The American Corundum and Emery Wheel Company has been incorporated at Chicago, with a capital stock of \$200,000, by Joseph S. Young, Edmund B. Switzer and Robert L. Hunt.

William B. Pollock & Company, of Youngstown, O., are engaged in turning out a large order for the Schoenberger Steel Company, of Pittsburg. The order is for materials for a number of new furnaces.

William Clark's Son & Company, of Pittsburg, Pa., have put two 20-ton open-hearth steel furnaces into operation. The mill has been working fairly well during the depression, and is almost in full operation at present.

The Midland Steel Company, Muncie, Ind., is making improvements in its plant costing about \$30,000, erecting a steel building, 80 ft. x 300 ft., to contain additional furnaces and appliances, and also adding a 500-H. P. boiler.

The Pittsburg Reduction Company has made some heavy shipments of ingot and sheet aluminum to Japan, where it is to be used in connection with shipbuilding, and in the manufacture of military accoutrements, culinary utensils, and novelties.

The New Castle (Pa.) Engineering Works has about completed a furnace which it has been building for the Girard (O.) Iron Company. This plant has been running very steadily since its reorganization some months ago, employing 200 skilled workmen and machinists.

The Sheffield (Ala.) Coal, Iron and Steel Company has contracted to sell 400,000 tons of pig iron at an advance of 50c. per ton over October prices. The company has also let the contract for the rebuilding of one of its furnaces, which will be put in blast as soon as the work is completed.

The Akron Iron and Steel Company's rolling mill property at Akron, O., which has been operated for the last 18 months by an organization controlled by the creditors of the old Akron Iron Company, will shortly be offered for sale. The operating company does not desire to make additional investments in new equipment, and it is probable that a new company will take hold of the property and make the improvements necessary to modernize the plant.

The Niagara Falls Power Company's new plant is now in successful operation. It consists of four of the Lefel celebrated Niagara type of turbines, each of about 2,200 H. P. capacity, or giving in all some 9,000 H. P. These turbines drive eight generators of something over 1,000 H. P. each; two generators being connected directly to the shaft of each wheel, one being placed on each side. This comprises the most complete and perfect electric water-power plant in the world. The same company has four other of the Lefel Niagara turbines, using in all eight of that style of wheel.

## TRADE CATALOGUES.

The Revere Rubber Company, whose works are at Chelsea and home office in Boston, Mass., have sent us a copy of their July, 1896, catalogue. They are manufacturers of high-grade mechanical rubber goods and deal in railroad, mill and fire department supplies. These comprise rubber belting, hose for all purposes, sheet packing, piston packing, valves, springs, gaskets, mats and matings, in fact every kind of rubber articles used in those lines.

The Atlantic Dynamite Company, of New Jersey, whose general offices are at Wilmington, Del., issues a catalogue of its products that commend itself at once to every user of high explosives. The giant powder and its properties are clearly explained, and the various accessories required for use in blasting are illustrated and their use shown. The preparation of the cartridge and the precautions that are necessary in the blasting operations are fully set forth, together with a special series of "dons" that can never be kept too prominently before the users of dynamite. The Atlantic Company manufactures every kind of giant powder, as well as giant gelatine and Judson powder, and deals in caps, fuses, electric blasting supplies and all other requisites for blasting.

The Joseph Dixon Crucible Company sends out the compliments of the season and a catalogue of its excellent productions in the pencil line, in the best and most practical form possible—a box filled with specimens of its work. Long use of Dixon pencils has shown their good qualities, and inspection of the present lot shows that the company is fully maintaining its standard of quality. The assortment includes not only the usual standard sorts, but some new varieties which the company has lately added to its list. Years ago it used to be said that pencils of the first quality could not be made here; but the Dixon Company has not only refuted the fallacy of this statement, but has established a standard which foreign makers have considerable difficulty in reaching, as an examination of the present catalogue fully shows.

## MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the *Engineering and Mining Journal* of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

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

## GENERAL MINING NEWS.

## ALABAMA.

COPPER HILL MINING COMPANY.—This company, which is developing and operating mines in Randolph and Talladega counties, has applied for a charter. They will organize a company to mine, mill, assay and concentrate ores, and perhaps erect a smelting plant in connection with their mining operations. A recent assay of a ton of ore from one of their mines was made, showing it contains 28% copper and 6.80 oz. of gold per ton. This ore is said to be present in large quantities, and to lie at an easy depth for mining. The corporation will capitalize at \$3,000,000, and is being superintended by D. W. Detrick, an expert miner of many years' experience.

## DE KALB COUNTY.

MONTAGUE & COMPANY.—This firm ships about 60 tons of fireclay and kaolin clay daily from its property at Kaolin.

## CALIFORNIA.

(From our Special Correspondent.)

MINERAL LAND LITIGATION.—An important land case was begun before Sylvester Hull, Register, and L. S. Barnes, Receiver of the U. S. Land Office in Redding, Shasta County, December 16th. The land in question was patented to the Central Pacific Railroad Company, by the U. S. government. The property lies near the boundary line of Trinity and Siskiyou counties, and is claimed as mineral land by Joseph E. Bell, Jewett Scranton, Chas. A. Abbott, Ellis B. Clark, Nathaniel Gardner, Geo. Coney, John McGrue, Valentine Doll, Patrick Holland, Dr. R. McClery, Michael Crowley, W. G. Welcher, Ernest A. Hayden, John H. Smith, John Houston, E. Knollen, Jacob and Lorenzi Pozzi, J. B. Foch, Jacob Pollard, Ed. Watson, H. G. Jaggles and H. D. Crofford. There are a number of rich quartz and placer mines now in operation upon portions of the tract. Some 40 witnesses have been summoned to testify in the case; the testimony will be very voluminous, and it is estimated that the taking of it will consume at least two weeks' time.

## AMADOR COUNTY.

(From Our Special Correspondent.)

EAST KENNEDY & NIAGARA.—These undeveloped claims, both adjoining the Keystone mine of Amador City, were sold December 8th by an order of the court made in probate proceedings on the estate of J. L. Collins.

KENNEDY.—At this mine, near Jackson, an accident occurred in the north shaft, which caused considerable damage to the buildings of the hoisting works. Both skips were in the shaft, one at the 1,050, and one at the 1,450-ft. level. The skip at the 1,450 was held by the brake. In some way the skip in the 1,050 broke loose, and went down the shaft, causing the skip in the other compartment to break

loose and go down. One went to the bottom of the shaft 2,300 ft., and the other stopped at the 1,800-ft. level. None of the men was injured. The mill may be shut down until the damage is repaired.

#### KERN COUNTY.

(From Our Special Correspondent.)

**ASHFORD MINING COMPANY.**—This company has been incorporated with a capital of \$200,000. The directors are Thomas Bull, W. C. Andrews, H. J. Ashford, L. R. Ashford and Harold Ashford. The property comprises the King Solomon, Hector, Dessert Queen, Kootenai and Magpie mines located at Randsburg. Some 600 ft. of shaft and drift work has been done on the claims. The King Solomon, at a depth of 150 ft., shows a 2 ft. lead of fine ore which assays very high. The extensions of both the Butte and Canyon leads have been opened on this property, these being two of the best paying claims in the district.

**STEVENS BROS. CLAIMS.**—This property comprises 18 claims about 15 miles south of Randsburg. A 2-stamp mill has been erected and is at work on \$40 ore.

#### LASSEN COUNTY.

(From Our Special Correspondent.)

The season just drawing to a close has been one of unusual prosperity for the quartz mines at Hayden Hill. The output of ore has been larger than usual, and in addition considerable development work has been done—and much more will be done during the winter—which will greatly increase the output of bullion next season.

**BLUE BELL.**—Considerable development work has been done on this mine the present season, and some rich ore was encountered. The vein is small, but the mine promises to be a profitable one.

**GOLDEN EAGLE.**—This mine has produced about 2,500 tons of fair-grade ore. The shaft has been sunk to the 400-ft. level and a steam hoisting plant put in. The mine finishes the season's work with a large body of good ore in sight on the lower level.

**HAYDEN HILL CONSOLIDATED MINING COMPANY.**—A company of local capitalists organized under this name is driving the Big Tunnel under the hill from the southeast side. They are now in about 1,500 feet and some favorable indications have recently been encountered. The tunnel is 8 ft. wide on the bottom, and 7 ft. high and is timbered in a substantial manner.

**HAYSEED.**—This is one of the newer mines which promises to become a good producer. The shaft is down only 180 ft. The building of a new 10-stamp mill has seriously interfered with the working of the mine. The total ore product has, however, been about 700 tons. The shaft will be sunk deeper during the winter.

#### NEVADA COUNTY.

(From Our Special Correspondent.)

**CALIFORNIA.**—At this mine they are advancing 20 ft. a week with the Burleigh drills, and are now in about 1,200 ft. of the 1,800-ft. tunnel. The ledge will be tapped at a depth of 600 ft. Work will be continued all winter.

#### PLACER COUNTY.

(From Our Special Correspondent.)

**OPHIR DISTRICT.**—About 150 men are employed in this district. New developments are being made on most of the properties. At the Gold Blossom mine 40 men are employed and the mill is being repaired. The ore is now being milled at the 10-stamp mill of the Eastern Gold Blossom.

#### RIVERSIDE COUNTY.

(From Our Special Correspondent.)

**LEON.**—At this mine, near Perris, the 20-stamp mill has just been completed. There are 5,000 tons of ore on the dump.

#### SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

**BRANCH & CROWELL.**—In Granite district this firm is developing the Big Tree No. 1, Bluebird, Combination No. 3 and Bay State mines. In the Big Tree the shaft is down 70 ft., showing 5 ft. of high-grade copper oxides.

**GRANITE DISTRICT.**—Several claims in this district have been bonded by Branch & Crowell to San Francisco and Denver parties.

**NORTH STAR GROUP.**—A new company has been organized to work these claims in the Virginia Dale district, about 100 miles east of San Bernardino. A 3-stamp mill is in operation.

**OCCIDENTAL MINING AND PETROLEUM COMPANY.**—On the property of this company, where a tunnel was being run in the mountain near Serena, oil has been struck. The petroleum bearing strata is about 30 ft. wide.

#### SOLANO COUNTY.

(From Our Special Correspondent.)

The county clerk has issued a call for bids for the sale of an electric power franchise in Solano County, as asked for by the Clear Lake Electric Power Company. The term of the franchise is to be for 50 years. Bids are to be opened on January 18th, in Fairfield.

#### COLORADO.

##### BOULDER COUNTY.

**NELSON.**—This mine, one-half mile east of Ward, has been sold by Mrs. Harriet Peck, of Albany, N. Y., for \$10,000 cash to J. H. Higman, G. F. Ford and Ed. Berryman. The Nelson mine is equipped with a small steam hoisting plant, which will be supplanted by a more modern one in the next two months. The property has a shaft 180 ft. deep and two levels run in a short distance. On the bottom level there is about 100 ft. of stoping ground, following up a 3-ft. crevice of good mineral, from which several carload shipments were taken that are said to have run \$96.40 per ton.

##### CHAFFEE COUNTY.

**BELMONT.**—This property is owned by Dominic Galino, and is located almost a mile north of Granite, just a short distance from the Rio Grande tracks. The lessees are tunneling on a good, strong vein, and are taking out some red hematite and iron pyrites, which run 2½ oz. gold to the ton. Among this ore there is quite a quantity of crystallized lead, about 10% lead and 13 oz. silver. The lessees have considerable ore on the dump, but will make no shipments until they have enough ore to take up the bond.

##### CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

**ARGO MINING, DRAINAGE AND TRANSPORTATION COMPANY.**—A personal inspection inside the Newhouse Tunnel at Idaho Springs, shows a large number of lodes cut at a vertical depth of about 1,500 ft., although the outer edge of the big mineral belt has but just been reached. It has proven the ground with depth and will be one of the greatest mining undertakings. The tunnel will be 25,000 ft. in length when completed and has now passed 1½ miles. Three shifts are driving with air drills. It is 12 x 12 ft. in size and 54,000 cu. ft. of blasted granite was removed in 30 days. There are over 1,100 known mineral-bearing veins, to be cut at a depth of from 1,800 ft. to 2,300 ft. within the distance, from now on, of 3 miles.

**CYCLONE.**—On McClellan Mountain, at Silver Plume, prospectors recently opened gold-bearing ore in the Cyclone claim. In doing assessment work a streak of peculiar looking stuff was opened, and it assayed 7 oz. of gold per ton. This comes from a section of the country which has heretofore been classed as exclusively silver producing.

**DUNDEBERG.**—By cutting through the wall on this lode at Silver Plume, a new ore body was found. The shaft was sunk on it, and levels are being driven, and some stoping is carried on.

**GRIFFITH CONSOLIDATED MINING AND MILLING COMPANY.**—This is a new incorporation for working a big group of claims on Griffith Mountain, near Georgetown. A consolidation of individual interests was made.

**NEW LOCATIONS.**—The county recorder reports over 500 mineral locations for 1896. Most of these are near the camps of Lower Clear Creek, in what is known as the gold belt.

**PELICAN-DIVES COMPANY.**—The machine drills have been discontinued in the Diamond Tunnel at Silver Plume, and the ground is to be worked by lessees. The ore in the new ground did not prove to run high in silver, and this is the reason given for the stopping of work. In stoping the ground above the tunnel there seems to be an improvement in the value of the ore.

**SILVER AGE.**—In sinking a new shaft on this property at Idaho Springs, an important ore chute was cut at 200 ft., and is to be drifted on in the direction of the older workings.

**VASTO MINING COMPANY.**—This company has just been organized by Leadville mine operatives for the purpose of working the Senator group of 24 claims near Idaho Springs. In the lower adit at 2,300 ft. a big body of high-grade ore was cut. It is considered one of the best strikes made for some time in Clear Creek County.

##### EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

**ANACONDA GOLD MINING COMPANY.**—This company, owning the choicest part of Gold Hill, recently sent out a circular to the effect "that the stockholders are requested to place their signature on a prepared card so that the secretary may have the signatures before him." This precaution is made necessary by reason of the increased value of the stock and the fact that certificates have been presented with forged endorsement, and as the company has no other way of knowing whether certificates are endorsed by the owner, this plan has been adopted. The mine steadily improves and now gives employment to 108 men.

**COLUMBINE TUNNEL.**—Recently a contract was let to drive 300 ft. additional from the Victor side on the southeast slope of Squaw; the tunnel from the northwest slope of Squaw has penetrated the hill about 800 ft. It was in this tunnel that the electric drill worked for several months, but the owners of the tunnel considered it more expensive than manual labor. Two well-known veins are expected to be intersected shortly.

**GOLCONDA MINING COMPANY.**—This company owns the Lucetta claim, on the north slope of

the Straub Mountain. The shaft has been sunk about 80 ft., but not on the vein. The rock is very hard and yields a little water. The claim is equipped with steam hoist.

**GOLD DOLLAR COMPANY.**—This company, owning several blocks of Arequa Townsite are forced to erect a larger boiler in order to handle an increase of water. Communication between the shaft and tunnel has long been delayed on account of the water.

**GOLD STANDARD MINING COMPANY.**—This company owns the Gold Standard tunnel, which penetrates Raven Hill from the north 1,000 ft. In that distance nine veins have been intersected, none of which have been producers. This was the first tunnel scheme started in the camp, and on one day in one of the hotels at Cripple Creek over \$10,000 worth of this stock at 10c. a share was sold to local people. This tunnel was located in March, 1892.

**GROUSE.**—This property, on Bull Hill, has made steady improvement during the last few weeks. The new shaft house and ore bins are completed, and the entire re-tiling of the shaft from surface to 180 ft. deep has just commenced, and will be carried on with vigor, and when completed sinking will be resumed. The second grade ore samples from \$30 to \$40, and the first grade from \$200 to \$350. The miners employed number 21.

**HANNAH BRITT.**—This claim is located on the apex of Bull Hill, and is recognized as being a good claim, but there exists some disagreement between the lessees and work has been suspended. Prior to the shut-down the property shipped from 10 tons to 12 tons of low-grade ore daily. The shaft has been sunk 125 ft. and is equipped with steam hoist.

**HILLSIDE.**—This claim (fractional) is being worked by Messrs. Kinney & Harnan, who have already sunk a shaft 200 ft. and have let a contract for an additional 200 ft. Several cars of good grade ore have been shipped from the vein in the shaft, but the ore pockets are rather uncertain in quality and quantity. This claim is on the south slope of Gold Hill.

**LUCKY GUSS MINING COMPANY, LIMITED.**—This company, of London, owner of the Lucky Guss claim on Bull Hill, is doing considerable development work. The shaft is being sunk below the 450-ft. level, two crosscuts are being driven toward the east vein, and the main vein is being developed by drifts both ways at the lower levels. By the improving appearance of the vein it looks as if the London syndicate had made a really good purchase.

**MAY BELLE.**—This block of ground, leased from the Lawrence Townsite Company, does not appear to be such a big bonanza as was first reported, as the shipments are few and far between. It was reported at first that the vein for over 7 ft. wide would average more than \$70. Another report was that the lessees had made arrangements for a special train of 16 cars, and that 31 sacks had been stolen, valued at \$31,000, but the sequel shows such reports to have been exaggerated. The apex of an ore chute was struck in the tunnel at a depth of 100 ft. and subsequent developments are necessary to prove the extent and value.

**MOORE.**—This mine, on Raven Hill, has been shipping but little for the past three months, and the force has been reduced from 57 to 20. The water in the shaft sinking below 650 ft., increased so fast as to drown the mine, but now with a new and larger pump at the 700-ft. level less difficulty will be experienced.

**PROVIDENCE.**—This claim, located in the town of Victor, was recently leased to Messrs. Doyle & Truax. A few days' work discovered mineral, a steam hoist and compressor plant were at once erected and shipments were made on a large scale, when a temporary injunction was secured, and the property is not a shipper.

**RAVEN MINING COMPANY.**—This company, owning the Raven mine on Raven Hill, is doing development work on a fairly good scale. The main shaft has been sunk 300 ft., the tunnel is being driven by machine drills by six men, winzes and raises are being pushed to communicate with the levels. The middle tunnel is also being worked, so that the reserves are always being increased. The mine employs 57 men.

##### HINSDALE COUNTY.

**LILLIE.**—This mine, which has been developed during the summer, by drifting from a 50-ft. shaft, has shown up well and the owners have started a long crosscut to cut their vein at a further depth of 250 ft. The ore already taken out is said to have averaged from \$75 to \$100 per ton.

**OCEAN WAVE.**—This mine has been equipped with a 50-H. P. boiler and a set of steam drills. Recently four cars of ore were shipped which gave net returns of \$3,100. The original lease had until January 1st, 1899, to run, but an extension until 1901 has been granted.

##### LAKE COUNTY.

(From Our Special Correspondent.)

**ALZAR GOLD MINING COMPANY.**—These people intend pushing work vigorously on their new shaft, on the Elk property, on Breece hill. They are at present advertising for bids to sink the shaft a further distance of 450 ft. or until mineral is encountered.

**GRANITE SECTION.**—Very encouraging reports come from the Granite Section, and quite a number

of properties that have been idle for some years are to be actively operated during 1897. The Yankee Blade has its shaft down 150 ft., and will on January 1st increase its force from 15 men to 50 men. The D. C. C. mine has all its machinery in place and is increasing its force. Its ore assays from 2 oz. to 8 oz. gold. The Mayflower was recently purchased by parties from Creede, and will be started up at an early day. The Monte Cristo is also to be started up very soon, after being idle for several years. The New York is one of the leading properties in the neighborhood, some of its ore running as high as 10 oz. to a ton. The shaft is down 105 ft. A big stamp mill near the scene of operations is handling all of the ore.

**LEADVILLE STRIKE.**—Not a particle of change is noted this week. It is learned from very good sources that money in the union is not as free as it was and there is complaint from some of the married men that their allowance has been cut down from \$10 a week to \$6. From what can be learned the scarcity of money, if not soon remedied, will mean the withdrawal of a large number of men from the union, who will go to work in order to keep their families from starving.

**MAMMOTH MINING AND MILLING COMPANY.**—This company has been sued by P. A. Kelly, who asks for an injunction restraining the company from issuing any stock, owing to litigation over certain claims belonging to the company.

**THISTLE-GOLDSMITH GROUP.**—This property lies in the Twin Lakes section of the county, and will, if the plans at present under way are carried out, be operated on a very large scale next year. The group includes the Thistle, Goldsmith, A. M. Thomas, J. D. Dana, W. A. Anthony and Millennium lodes. Besides this there is the Anthony mill site in the consolidation containing 70 acres of ground. Eastern capitalists have been interested in this property, and Professor Mills, of the University of Pennsylvania, has been on the ground making a thorough examination before reporting to this new combination. He made 17 assays, which proved that the ore exposed in the workings ranged from a good mill test to several ounces in gold. The report made by the expert is said to have been more than satisfactory. The ground in question is developed by three shafts and a crosscut tunnel 140 ft. long. This exposes a vein showing gold from \$5 to \$65 in value. In the shaft the vein is from 5 ft. to 17 ft. wide. The owners also have a 10-stamp mill erected on the ground which is operated by water power. It is learned that the prospective owners are all Pennsylvania people.

#### OURAY COUNTY.

**VIRGINIUS MINING COMPANY.**—An accident occurred in the Virginius mine on December 18th by which five men were killed. They were standing on the cage repairing some defective timber in the old shaft, when the cable suddenly parted and the men shot down to the lower level, 1,400 ft. below. All were instantly killed, and their bodies were horribly mangled.

(From Our Special Correspondent.)

**DANIEL BONANZA.**—Anderson Brothers have taken a lease on this property and have a small force of men employed. They are shipping considerable quantities of high grade ore from the old shaft.

**DENVER.**—McDonald and others, of Leadville, have secured a lease on this mine, on Mt. Hayden, and have begun operations at a point some distance below the old tunnel. They will run a crosscut to the vein, tapping it at a depth of 200 ft.

**GEM.**—Story & Stevens are shipping large quantities of fair-grade ore, in which copper predominates but carrying enough gold to pay expenses of treatment. The tunnel is in 600 ft.

**JONATHAN.**—M. Moore and others are employing several men engaged in running a tunnel below the old workings in order to catch the ore body at a greater depth.

**NEOSHA.**—Holt & Foster, two well-known mining men, have secured a lease on this mine on Mt. Hayden and have four men at work in the old tunnel on 4 ft. of milling ore. The ore will be shipped to the Bright Diamond mill for concentration.

**O. & N. TUNNEL COMPANY.**—Eighteen inches of ore was opened up the week of December 20th, which assays 32 oz. gold per ton.

**VIRGINIUS MINING COMPANY.**—Four hundred employees of this company, working at the Revenue tunnel, dropped their tools and quit work December 11th. The trouble arose over the refusal of the management to discharge one of the new shift bosses, whom the miners disliked. The mine was shut down, ostensibly for the winter, and the mill, after operating a few days longer on ore then on hand, was also closed. Vague whisperings are now circulating, however, which point to a resumption of work at the Revenue about January 1st with an almost entirely new crew. The strike, although affecting several hundred men, was one apparently devoid of hard feelings on the part of both men and management, the former quietly making their demand for a discharge of the shift boss, and the management refusing to accede.

#### RIO GRANDE COUNTY.

**TORNADO.**—At Embargo camp, 18 miles northwest of Del Norte, a lead carbonate strike 10 ft. below

the surface on this lode is reported. The owners are Bassett & Posse, of Del Norte.

#### SAN JUAN COUNTY.

**RED AND BONITA MOUNTAIN MINING COMPANY.**—This company, working near Gladstone, is pushing its two tunnels vigorously. In the upper tunnel, two veins of concentrating ore, that run well in silver and lead, have been cut. Both tunnels are now in 300 ft. and will be driven to a distance of 1,000 ft. Twenty men are employed, and a mill is to be erected on the property in the spring.

#### SAN MIGUEL COUNTY.

**C. L. GODARD & COMPANY.**—The Tiger, on Bell Creek, is owned by this firm. Twelve feet from the surface a 10-in. vein of carbonate ore was encountered, which ran high in silver. The drift is now in about 35 ft., and at that depth the vein has increased to 23 in. in thickness, and runs higher in silver and several dollars in gold. From 20 assays no less than 97 oz. silver was had. The vein carries gray copper, galena and pyrites, but little lead. A car of the ore has been sacked and shipped.

**GOLDEN RULE MINING COMPANY.**—The latest strike of importance is at the Picayune, one of the Picayune group owned by this company. For several weeks an 8-in. vein of high-grade ore has been followed in the drift, and recently a 3½-ft. body of iron oxides and chlorides was broken into which, it is said, runs 2 oz. gold, 55 oz. silver and 30% lead. The width of the body of ore is upward of 10 ft. Manager C. A. White is in charge of the work, and has shipped the first carload of the ore.

**PANDORA MINING AND TUNNEL COMPANY.**—This company has been incorporated by D. H. Moffat, William H. Bush and H. M. Hogg, John T. Graham and Charles L. Howell, of New York. The capital stock is \$1,000,000. The Pandora tunnel is intended to be for Telluride what the Cowenhoven tunnel is in Aspen and the Moffat tunnel in Cripple Creek. It will be 6,000 ft. long and 9 ft. high by 10 ft. in width. It will run through the Marshall Basin and tap the following veins: The Tomboy, the Belmont, the Japan-Climax, the Flora, the Occidentals, the Whale, the Patrick Henry, the Pandora and others.

#### IDAHO.

##### LEMHI COUNTY.

**MONOLITH MINING COMPANY.**—The incorporators of this company, together with the amount of stock taken by each, are as follows: Junius F. Wells, 199,970 shares; Le Grand Young, Thomas W. Sloan, Heber M. Wells, Spencer Clawson, Oscar W. Moyle, of Salt Lake, and Alexander Toponce of Ogden, each five shares. All seven subscribers are directors of the company, with Junius F. Wells, president; Le Grand Young, vice-president; Heber M. Wells, treasurer, and Thomas W. Sloan, secretary.

The stock of the company, \$1,000,000, is divided into \$5 shares, and is paid for by the transfer to the company of the following mining property in Mineral Hill mining district: Monolith lode claim, Monolith No. 2, Gold Bug, Golden Crest, Summit, Bismarck. A water right belonging to Alexander Toponce and a millsite on Boulder Creek are also included in the inventory of the new company's property.

#### INDIANA.

**MINERS' STRIKE.**—The strike of the bituminous miners of the State, which began May 1st, has come to an end. The men at the mines in three counties, representing 2,000 miners, have voted to accept the 5 cents reduction from 60c. a ton. Some of the men from other fields had gone to work at 55 cents, and many more had been conceded the 60 cents. It is understood that the operators now paying 60 cents will ask their men to accept the reduction.

#### KANSAS.

##### CHEROKEE COUNTY.

(From Our Special Correspondent.)

**ADKINS, NAILS, DONEHOE & COMPANY.**—On the Ihseng land they have sunk 10 ft. to take up a rich stop, and will make a large output of ore this week.

**BABY ELEPHANT COMPANY.**—At the mine on the Bunco lease they are drifting on a large face of lead and zinc ore in open ground, and last week produced 24,900 lbs. of lead and 14 tons of zinc ore.

**FORTY-EIGHT COMPANY.**—This company has leased 4 lots on the Bunco lease, and is sinking a shaft on each lot. At the discovery shaft at 45 ft. they have a 5-ft. face of lead, and under the lead they have a 13-ft. face of zinc ore. The company has built a fine steam concentrating plant on which they concentrate their own dirt during the day and do custom work at night.

**HORNING & COMPANY.**—At shaft No. 1 they are drifting at 115 ft. on a large face of ore and last week made 41,700 lbs. of zinc ore and 3,000 lbs. of lead. At shaft No. 2 they are drifting at 100 ft. and last week made 9,700 lbs. of zinc ore and 4,700 lbs. of lead ore.

**LARABEE, McCURDY & COMPANY.**—The old Windsor and Hoy tracts of lands, the last of the abandoned ground about Galena, is to be reclaimed by a company composed of the following gentlemen: F. S. Larabee, F. D. Larabee, H. S. McCurdy, R. De Graaf, O. H. Bangs and G. D. Foot, of Staffork, Kan.; John Roberts, of Hutchison, Kan.; A. D. Larabee, of Cripple Creek, Colo. The company has

secured a lease of 45 acres of the Windsor and 40 acres of the Hoy land and will get pump rental from other tracts for draining the ground. Short Creek is to be flumed a quarter of a mile, the flume to be 6 ft. wide and 4 ft. deep. When the water is out the creek bed will be cemented and the banks protected against an overflow of high water. Several Wonder pumps have been placed and a Chinese pump is being built. It is expected to have the water out by the first of February.

Ore in paying quantities has been taken out from 10 ft. down to 60 ft. Miners who know this ground are anxious to secure lots, but none will be leased until the water is out.

**LEA & BURGER.**—They have developed a large body of lead and zinc ore at their Portland mine on the Monte Cristo lease. They struck the lead at 40 ft. and the zinc ore at 85 ft., and will make a large output of ore.

**MASON & COMPANY.**—A lease has been obtained of the E. N. Perry land, south of the J. R. Holmes' lease and a 14-in. crusher has been put in. A rich 15-ft. face of zinc ore exists at 85 ft.

**M. M. KERSH.**—A lot on the Ihseng land is producing from 10 tons to 15 tons of zinc ore weekly on hand jigs. Drifting at 85 ft. is on a large face of high-grade ore.

**M. M. MINING COMPANY.**—This company is drifting at 90 ft. on a large face of ore. Last week they made 130,750 lbs. of zinc ore and 5,000 lbs. of lead ore on hand jigs.

**OL SPARKS & COMPANY.**—Drifting at 100 ft. is on a large face of zinc ore in open ground, and last week the face opened up larger than ever in very rich dirt. They will make over 25 tons of zinc ore this week. The same company is drifting in the Bunco Company's pump shaft, and at 100 ft. are taking out rich dirt.

**OLD COON COMPANY.**—This company is drifting at 85 ft. on a large face of ore in open ground and last week on hand jigs cleaned up and sold 3,530 lbs. of lead and 71,710 lbs. of zinc ore.

**PAGE & THOMON.**—They have leased the Maggie Taylor tract of land in the city limits of Galena, and are opening it for mining again. This is one of the best producing leases in the district. Seven shafts are being worked.

**SAWYER & COMPANY.**—They are drifting on a large face of ore in flint and s-lvedge ground and last week produced 100,080 lbs. of zinc ore and 5,000 lbs. of lead ore.

**SHELBY, COLT, SHORT & COMPANY.**—This company is composed of the following gentlemen: Gen. Joe Shelby, United States Marshal of the Western District of Missouri; C. C. Colt, of St. Joseph; Lem and Earle Short, of Joplin, Mo. Ten acres of the Connor land, near the State line, has been leased. A 12-ft. face of high-grade zinc ore has been opened up at 65 ft. in open ground. Last week they put in new hand jigs, screen and platform, and will make their first turnin of ore.

**SILVER DICK COMPANY.**—This company is drifting at 100 ft. on a large face of zinc ore in open ground, and last week on hand jigs they made 67,790 lbs. of zinc ore. They have lately put in a steam hoister, and made their first turnin a short time ago.

**UNION MINING COMPANY.**—This company has a large concentrating plant, and is bolting dirt from two shafts and drifting at the 85-ft. level. Last week they produced 47,300 lbs. of zinc ore and 28,240 lbs. of lead ore.

#### MISSOURI.

##### JASPER COUNTY.

(From Our Special Correspondent.)

**JOPLIN ORE MARKET.**—The output of ore last week was good, although there were two rainy days. The price paid for zinc ore was \$25 per ton for the highest grade and the prices for the lower grades were from \$20 to \$24 per ton. The sales of ore at Joplin, Webb City, Cartersville and Galena were less than the week before and at the other camps were more than the preceding week. The sales and output of lead ore were less than the week before on account of the weather and the low prices. The price paid for lead was \$16 per 1,000 lbs., delivered. The turn-in from the different camps was as follows: Joplin zinc, 1,319,790 lbs.; lead, 208,750 lbs.; value, \$19,837. Cartersville zinc, 1,045,520 lbs.; lead, 184,440 lbs.; value, \$13,705. Webb City zinc, 412,860 lbs.; lead, 55,220 lbs.; value, \$5,423. Galena, Kan., zinc, 3,140,000 lbs.; lead, 41,100 lbs.; value, \$35,700. Aurora zinc, 730,000 lbs.; lead, 41,100 lbs.; value, \$5,340. Oronogo zinc, 113,900 lbs.; lead, 3,740 lbs.; value, \$1,408. Alba zinc, 166,000 lbs.; value, \$1,450. Scott City zinc, 81,530 lbs.; value, \$1,049. Totals last week: Zinc, 6,959,650 lbs.; lead, 973,250 lbs.; value, \$82,882. Totals for 51 weeks: Zinc, 300,524,290 lbs.; lead, 52,743,920 lbs.; value, \$3,743,614.

**DENISTON, LANE & KANNAR.**—Chunks of lead are being found in cutting a drift from an old shaft. McAbee & Co. first took the lot and cleaned out the old shaft to 50 ft. Moore & Ashby worked it some time and gave it up. Then the first-named trio got the lot, and at 75 ft. started a drift opposite an old drift, and a stroke with a pick brought out a 10-lb. chunk of lead ore, which continues to improve.

**HOLLINGSWORTH & GRIMSLEY.**—Work at cleaning out an old shaft, that Mr. Hollingsworth sank to a depth of 95 ft. in 1881, is progressing. He say

he had zinc ore from 35 ft. to 75 ft.; but as it was worth only \$9 per ton then he looked deeper for lead ore, and was drowned out when the pumps stopped draining the grounds.

**J. E. HUBBARD.**—A lease has been obtained of 22 city lots of the North Heights addition to Joplin. At present there is no water to bother at a depth of 105 ft. Mr. Hubbard has four shafts, one 80 ft., one 105 ft., one 40 ft., and another 48 ft. deep. In the deepest shaft is a 15-ft. face of zinc ore, in the 80-ft. shaft a 20-ft. face of zinc ore, and in the other two shafts there are good indications of lead.

**LOCUST COMPANY.**—At the Locust plant they have developed a large and rich face of zinc ore at 147 ft. in flint ground and are making from 6 tons to 8 tons of high-grade zinc ore each 10-hour shift.

**MOHASKA MINING COMPANY.**—In 1892 a company of English capitalists secured 160 acres of Dr. Carthage. The land lies south of Joplin just outside the city limits. It was at that time producing quantities of zinc and lead ores. It was operated until the summer of 1893 when the price of ore became so low on account of the panic, that the pumps were drawn, and since then only shallow drifting has been done for lead ore. The company's property is being managed by W. A. Jeffrey, an Englishman, who has resided in Joplin four years. Five companies now have pumps on the various parts of the West eighty of this tract, and preparations are being made to develop the lower levels. Gardner Brothers were the first to put in a pump and one week paid a royalty of \$400. C. Egg, Ellis & Company have five lots. They have sunk a new shaft 83 ft. and are getting zinc bearing rock. On the 45-ft. level a 12-ft. face of ore bearing rocks was passed through. C. N. Stark has leased 20 acres of the Mohaska tract in which several Eastern parties are interested. An 8-in. pump very successfully drains the water to 100 ft. where a drift is being cut on a 12-ft. face of zinc and lead bearing rock. Last week 8,640 lbs. of zinc ore was sold, the first turn in. This mine is located north of the Anna Baxter, that was a big producer six years ago.

**ROBERT MOORE & COMPANY.**—This firm has leased 42 town lots in Hutton & Co.'s addition to the town of Joplin, and are draining the ground to a depth of 107 ft. At present an air drift is being cut at 75 ft. on lead dirt, and a face of zinc ore exists at 107 ft.

**YARKO & ROBINSON.**—This firm has eight lots on North Heights and are drifting at 60 ft. on a rich face of lead dirt. They have a horse hoister and one hand jig and will make their first turn in this week.

#### MONTANA.

##### BEAVERHEAD COUNTY.

**ARENA AND GOLDEN EAGLE.**—J. H. Dunn, C. S. Fosselman and several other residents of Butte have secured a bond and lease on these mines near Dillon. They are gold properties, and \$125,000 worth of gold ore has been taken from them. No work has been done for 6 years until the present people secured control. A shaft is down in the Arena to a depth of 300 ft. It is necessary to haul the ore by wagon 15 miles to Dillon to load it on the cars. Assays are said to run from \$72 to \$80 in gold.

##### JEFFERSON COUNTY.

(From Our Special Correspondent.)

**DIAMOND MINING COMPANY.**—The Union Iron Works of San Francisco, Cal., has secured the contract to build a 120-stamp mill for this company on its property, in the St. Louis Mining District. It will be modern in every respect, of 500 tons per day capacity. A set of vanners and a cyanide plant will also be added.

##### MADISON COUNTY.

(From Our Special Correspondent.)

**BERTHA.**—C. L. Hathaway has a bond on this mine and is putting up a mill. The building is about completed and the machinery is being put in place as fast as the weather will permit. One Crawford mill will be used this winter, though the building has been constructed with the view of placing three more next season. An alleged improvement has been made in the Crawford mill by Mr. Hathaway, whereby he saves the gold on amalgamated screens. The Bertha ore is a decomposed quartz containing free gold, which is very flaky and light. Development work is in progress and will mainly consist this winter in sinking the working shaft to the 200-ft. level. The vein is 7 ft. wide in places and the pay ore averages about \$15 per ton in gold.

**EASTON.**—The new concentrator at this mine has been completed, except the slime-table room, and is a model of convenience. It has 10 950-lb. stamps, three 6-ft. vanners and one 4-ft. corrugated vanner. At present 24-mesh screens are used, though experiments are being made with 16 and 18-mesh, with the probability that 18-mesh will be presently adopted. Its present capacity is about 35 tons per day. The mine is well developed to the 300-ft. level. The main chute is 500 ft. long, from 3 to 5 ft. in width, and will average 35 oz. in silver and 1 oz. in gold. Henry Elling owns and operates the property, which is six miles southwest from Virginia City.

**GARNET GOLD MINING COMPANY.**—This company, near Pony, had to shut down its new mill on account of cold weather. Work in the tunnels will continue all winter, and the mill will be in operation by March 15th, 1897.

**KENNETT MINING COMPANY.**—This company has

suspended operations for the winter, on account of the exposed situation of the mines and the lack of buildings, boarding house, bunk houses, etc. The main shaft is down 357 ft. and has apparently reached water level. The ore at this depth is iron pyrites, whereas above it is free milling. At 150 ft. and 235 ft. levels have been run and large bodies of ore exposed. At the bottom of the shaft a crosscut shows 32 ft. of ore in the two parallel veins. It is a low-grade proportion, and the manager, W. B. Millard, states that it has an average assay value of about \$7. It is the intention of the management to build reduction works in the spring.

**MAYFLOWER MINING COMPANY.**—This company has been incorporated by Alex. J. Johnston, Charles W. Clark and Arthur Harvey Wetney, of Butte, with a capital stock of \$100,000. Its main office will be at the Mayflower mine, near Gaylord. This mine was struck only last summer and is already a large gold producer. The locators shipped \$60,000 worth of ore and sold the mine to W. A. Clark, of Butte, for \$150,000. The ore crops out and was considered worthless. It is an inferior looking mixture of dolomite and shale. It averages 14 ft. in width and assays about \$125 per ton in gold.

##### SILVER BOW COUNTY.

**BUTTE & BOSTON MINING COMPANY.**—The reorganization plan and agreement is issued by the reorganization committee, E. Rollins Morse, Samuel Carr, Gordon Abbott, William A. Gaston and Thomas Nelson. It recites the preliminary agreement of March last, under which securities were deposited, and adds a supplemental agreement and outline of the reorganization plan. This agreement, which security-holders are at liberty to sign or assent to, if they have signed the earlier agreement by failure to withdraw deposits already made, conveys to the committee all the usual powers to carry out the plan as set forth, or to modify it in more or less essential particulars, or to decline to carry it out, etc., etc. Certain alterations security holders may dissent from if they desire, and a method of dissent is provided. The committee is empowered to do whatever its members will, as individuals, independent of their duties as a committee, may join in underwriting, etc. The committee may form a voting trust, if it concludes to do so, for any period decided upon. The agreement seems to provide for any probable or possible contingency which may arise in the attempt to execute the plan, or, in the future, to execute it. The plan provides for the formation of a new company, and the creation of these securities: \$1,500,000 first mortgage 20-year gold bonds, to be exchanged for old first mortgages, bond for bond, and requiring \$1,000,000, leaving \$500,000 to be exchanged for the \$1,000,000 consols at 10% for the latter; also \$2,000,000 capital stock, par \$10, to be exchanged for the present 200,000 shares, par \$25, share for share, on payment of \$10 per share. This virtually cancels the old capital stock and sells the new stock to the old stockholders at its full par value, or to the underwriters at par value, less a commission, understood to be \$1 per share. The payments of the assessment by depositors of common stock must be made at the offices of the Old Colony Trust Company, of Boston, as follows: \$2.50 thereof at the time of the deposit of the certificates, which shall not be later than January 15th, 1897. Those stockholders of the present company who have already deposited their stock shall make said first payment on or before January 20th, 1897. The remainder is payable in three installments of \$2.50 each on the 15th days of February, March and April, 1897. The \$2,000,000 of money provided for under this plan is to be devoted, after payment of the cash required, to effect the purchase of the properties, the underwriting charges, debts incurred by the receivers, receivers' certificates (if any be outstanding at the time), and receivers' fees, and of the legal charges and expenses incident to the foreclosure, litigation and reorganization: (1) To the payment of the past due coupons on the first mortgage bonds, at par, without interest, and to the payment of 50% of the past due coupons on the consolidated mortgage bonds without interest. (2) To the payment of the judgments against the properties not covered by either mortgage, and amounting to about \$380,000, beside interest, which the committee is to adjust and arrange to pay in suitable installments. (3) To the payment of the floating debts, estimated at \$120,000, the time for and the terms of the payment of which the committee is to arrange. (4) To the acquisition of such of the securities of the present company as the committee may see fit to acquire in the interest of the reorganization.

All payments must be receipted for by the depositor on the certificates of deposit. The holders of certificates heretofore issued by the Old Colony Trust Company upon the deposit of securities, under the agreement of March 16th, 1896, will be entitled to the benefits of this plan, without the issue of new certificates, provided that if, whenever required by the committee, and within the time limited therefore, such existing certificates be produced to the trust company and stamped as assenting to this plan and to the accompanying agreement. Failure to pay any installment when and as payable will subject the deposited securities and all rights on account of any prior payments to forfeiture. Pending their use for reorganization purposes, all securities heretofore deposited with the Old Colony Trust Company of Boston, under the agreement of March 16th, 1896, and all securities that may be hereafter deposited under the terms of this plan, and of the

agreement accompanying the same, shall be held by the Old Colony Trust Company subject to the order and full control of the committee. All such vouchers and securities are, in the discretion of the committee, to be kept alive so long as in their judgment they may be necessary for reorganization purposes.

#### NEW MEXICO.

##### GRANT COUNTY.

**STEEPLE ROCK DEVELOPMENT COMPANY.**—This company will soon put in an experimental plant to determine the best method of reducing their ore. The Carlisle Gold Company, Limited, which operated on an extensive scale in the Silver City District some years ago, treated the ore from its mine in a 60-stamp mill, and succeeded in mining ore at a profit for less than \$5 a ton. The Steeple Rock Company will put in Huntington mills and a chlorination furnace in which to reduce the concentrates, and expects to be able to reduce the ores at about half the former expense. Its plant, when completed, will have a capacity of about 1,000 tons of ore a day, or about eight times the capacity of the old plant at Carlisle.

##### LITTLE WHITE WATER DISTRICT.

(From Our Special Correspondent.)

**SUNNY SIDE.**—After drifting 25 ft. on a seam the owners have struck a 3-ft. vein averaging \$36 per ton in gold.

**WABASH.**—After driving through good free milling gold ore the drift on this vein ran into a "horse" of country rock which pinched out the ore. The end of the horse is now nearly reached and ore is again coming in on the foot-wall.

##### SOCORRO COUNTY.—COONEY DISTRICT.

(From Our Special Correspondent.)

**HELEN MINING COMPANY.**—The Black Bird mine, belonging to this company, is showing up well. Six feet of ore on the hanging wall, averaging \$30 per ton, has been struck on the east side of No. 3 shaft, above the main tunnel level. Shaft No. 3 is being sunk by contract to a depth of 160 ft. below the main tunnel level, when connection through the 160-ft. level with shaft No. 2 will be made. This will give shaft No. 3 a total depth of 450 ft. from the surface. The enrichment of vein in this placer, as well as enlargement of vein, and presence of great bodies of mud (manganiferous) is undoubtedly due to the Pacific vein which here joins the Confidence or Last Chance vein on the hanging wall side and, unable to cross the strong foot wall, follows the vein. From the crosscut from the main tunnel on the Confidence vein drifts are being run on the Pacific vein, and slopes have been started. The Confidence mill is dropping 20 stamps.

**LITTLE FANNY.**—It is reported that this mine will start working by January 1st, 1897. The mine has been shut down since December, 1895, mainly due to litigation. The output from this mine in 11 months of 1895 was \$91,000. The last month's run gave an average battery value of \$21.41 for 874 tons treated. Practically all of this ore came from the 230 ft. level, 700 ft. west of the shaft. The level was run 10 ft. wide and everything between walls was sent to mill and gave the above average.

**MAUD S.**—This property will shortly resume work. Over \$250,000 have been taken from this mine in the last three or four years, and it is with reason considered one of the best mines in the camp. All that is needed is development work. No level was yet run in this mine that did not strike ore, only as the ore is dipping away from the shaft the long distance to be driven has undoubtedly scared the owners. The shaft, which is 375 ft. deep, has been sunk in barren ground since a depth of 50 ft. In the 150-ft. level ore was struck 250 ft. west of the shaft and in the 300-ft. level 300 ft. west of the shaft.

#### NORTH CAROLINA.

##### CABARRUS COUNTY.

(From Our Special Correspondent.)

**REED.**—This mine, near Georgeville, is being worked in a small way by Dr. Lisle and associate, of Springfield, O. They are finding some gold in the placer work and contemplate working the vein deposits.

**TROUTMAN.**—This mine, near Gold Hill, is being prospected by some Colorado parties, who have erected a three-stamp mill.

##### GRANVILLE COUNTY.

(From Our Special Correspondent.)

Four miles from Oxford a new mining district is being prospected. Several locations are being worked and producing rich gold ore, which is quartz with free gold and pyrite, also a little galena. Capt. Geo. Horn, an Australian, has erected a fine-stamp mill and report says is making a rich return in gold. Notices forbid any visitors in or on the property.

E. B. C. Hambley, a prominent London mining man, is opening a property in the vicinity and has developed his vein in a systematic manner by shafting at intervals of 100 ft. Several parties have visited the district of late and all seem highly pleased.

##### MONTGOMERY COUNTY.

(From Our Special Correspondent.)

**SALLIE COGGINS.**—This mine is being operated by Captain Munhall and associate, of Pittsburg, Pa. They are developing and testing a large belt of low-

grade gold ore. The work of late has all been done by contract, viz., the ore has been mined and delivered to the mill (10 stamps operated by steam power) for 15c. per ton. The milling by contract is at the same price. This is probably the cheapest on record, yet it is a question whether or not the methods employed are wise regarding the saving of the gold and the amount of dead slate that may be carried to the mill. The mine is near Edorado, and is in a good district.

#### RANDOLPH COUNTY.

(From Our Special Correspondent.)

**KEYSTONE.**—This gold mine, under the management of W. J. McKee, of Lytton, N. C., will soon have a 40-stamp mill in operation. It is said they will add a cyanide plant to the mill. Not long since in this connection a prominent and reliable mining man in this State informed your correspondent that chlorination was more advantageous here, as it could be done at 75c. per ton.

#### STANLY COUNTY.

(From Our Special Correspondent.)

**NEW LONDON ESTATES COMPANY, LIMITED.**—The Parker mines, owned by this company, of London, have gone into liquidation, strange to say, when they have better prospects now than at any previous time, since they own the property. In the 120-ft. level they have a well-defined quartz vein carrying ore of the value of \$4 to \$10 per ton, and plenty of it. As this ore can be mined and milled for \$2 per ton, it would seem that they are leaving a paying investment.

**LITTLE FRITZ.**—This is the name given to the old Culp mine, near Gladstone. Here they have an Elpass mill from Colorado. It is said the mill will do two tons per hour and is in successful operation in Colorado in several places. The mine is owned and operated by Dr. Woods and Frederick Betts, Esq., of Pueblo, that State.

**LOUDER.**—Dr. M. Souvielle, of St. Louis, Mo., has secured an option on this gold mine, and is pumping the water out.

#### PENNSYLVANIA.

##### ANTHRACITE COAL.

**DELAWARE & HUDSON CANAL COMPANY.**—An explosion occurred in Baltimore shaft No. 2 of this company, at Wilkes-Barre, on December 21st. Twenty-seven men were rescued alive after about six hours of terrible suspense and work, and will probably all live. The accident is said to have been due to an explosion of dynamite caused by a fire, which spread and got beyond control. The explosion occurred just at the time the night shift men were going on and the day shift men were finishing. Had it been an hour later or earlier the loss of life might have been appalling. The mine is not generally gaseous, and the men worked with naked lights, there being comparatively little danger of encountering large bodies of gas.

The accident happened on a plane and another theory is that it was caused by feeders of gas being ignited by the naked lamps of some of the men. A "feeder" is an opening in a body of coal, through which the gas confined in the coal escapes, sometimes with great force. It is believed that there was a considerable body of gas on the plane, and that one of the feeders came in contact with a lamp and the explosion followed. The explosion of itself was not extremely violent.

The accident happened at 5 o'clock, and it was not until late in the evening that the last men were brought out of the mine. Three of these are in a precarious condition from breathing the afterdamp that followed the explosion, but it is believed that no deaths will result.

##### BITUMINOUS COAL

**BITUMINOUS MINE LAW.**—An important decision has been handed down by Judge Cyrus Gordon declaring the mining law, the Act of May 15th, 1893, unconstitutional. He so decides on two grounds:

First—It is in conflict with Articles III. and VII. of the Constitution, which declare that the General Assembly shall not pass any local or special law regulating labor, trade, mining or manufacturing, because it does not extend to the entire State nor to all the bituminous coal mines therein; but is confined to the coal mines which, at the time of the passage of the act, "were not included in the anthracite boundaries." The act, he says, practically divides the State into two sections and legislates for one of them. This is local legislation.

Second—The act is in conflict with Article III., Section 3, of the Constitution, which provides that "No bill . . . shall be passed containing more than one subject, which shall be clearly expressed in the title." The title reads: "An Act relating to bituminous coal mines, and providing for the lives, health, safety and welfare of persons employed therein." There is nothing in the title, Judge Gordon says, indicating that the violation of its provisions would constitute a crime or misdemeanor, punishable as such, and yet the act creates such crimes and provides for their punishment.

**NEW COKE FIELD.**—A new coke field, outside of the Connellsville field and yet closely identified with it, is soon to be opened. The district comprises scattered patches of coal land aggregating upward of 100,000 acres. It lies on both sides of the Monongahela River, in and above the fourth pool, extending into West Virginia. The improvement of the Monongahela and the freeing of that stream from tolls will be a great factor in the development of this territory. Most of the land lies in Fayette

County south of the Connellsville vein outcrop. Manufacture of coke from this coal will be no experiment, as three plants, that have in all about 250 ovens, are now in operation. They are the works of the Washington Coal and Coke Company, Smock Coal Company and a small one owned by E. A. Humphreys. The coal in which these companies are operating is an intermediate vein, a little harder than standard coking coal, and not as firm in grain as the regular Pittsburg seam mined on the river.

#### BUTLER COUNTY.

**SCHEIDEMANTLE & COMPANY.**—This company's No. 1 well, on the J. C. Renfrew farm, 200 ft. west of the White well, at Renfrew, has struck the pay-streak at 19 ft. in the third sand and commenced flowing steadily. It made 66 bbls. the first hour and is flowing 50 bbls. an hour at the latest report from it. This strike has increased the interest in that field and an appreciation in the price of leases. The Heydrick gusher, at Parker, has been stirred up and its production ran up to 75 bbls. an hour.

#### LANCASTER COUNTY.

**SOUTH MOUNTAIN MICA COMPANY.**—Howard L. Elton, of Philadelphia, has conveyed all his interest in certain lands in West Cocalico Township to this company, a corporation of West Virginia, for \$70,200. The property is part of the old Coleman estate and is located in Lancaster County, on the border of Lebanon County. It adjoins the Cornwall estate and contains valuable deposits of mica and iron ore.

#### SOUTH DAKOTA.

##### FALL RIVER COUNTY.

**NEW SMELTER.**—F. C. Grable, ex-Governor Pattison, of Pennsylvania; Thomas Bradley, of Philadelphia, and John Archer, of New York, accompanied by a party of Eastern capitalists, were in Edgemont December 17th. Before leaving Philadelphia Mr. Grable, representing an Eastern syndicate, signed contracts for the erection of a smelter at Edgemont. The cost of the plant will be about \$300,000, with an equal amount of money subscribed for the purchase of ore. Work on the smelter is to begin at once, which will be a custom plant, but the syndicate owns developed mines.

#### TENNESSEE.

##### POLK COUNTY.

**DUCKTOWN SULPHUR, IRON AND COPPER COMPANY.**—This company is reported to have made a recent shipment of 10 carloads of copper ore to London.

#### UTAH.

##### JUAB COUNTY.

**RABBIT-FOOT MINING COMPANY.**—This company has been capitalized at \$300,000 in shares of \$1 each, by W. H. Donnell, C. K. McCormick, J. H. McGahn, Mary R. Stanton and W. H. Myers, each holding 1,000 shares, while the balance is held by W. H. Donnell as trustee. The company owns the Evening Star and the January lode in the Tintic mining district, near Silver City. The officers are: W. H. Donnell, president; J. H. McGahn, vice-president; W. H. Myers, secretary and treasurer.

**SOUTH SWANSEA.**—The largest shipment of silver ore ever sent out of Silver City on one train went out December 12th, consisting of eight carloads, or 187 tons, from this mine. One carload was entirely of an especially high-grade ore, running from 100 to 125 oz. silver and 6% to 65% lead.

#### PIUTE COUNTY.

**WEBSTER.**—Report comes from Marysvale that ore of the value of \$450 in gold and containing 400 oz. silver per ton has been encountered in this mine, owned by R. C. Chambers, J. B. Haggin and W. R. Hearst. A tunnel has been run in on the ledge for a distance of 1,400 ft., and in the breast there is exposed 6 ft. of galena and carbonate of lead that shows 23% lead, 25 oz. silver and gold of the value of \$1.50 per ton. From the tunnel station a crosscut was recently run 180 ft. west, and in the porphyry is now exposed 10 lb. of the very high-grade ore that has at times been found in the district.

#### SALT LAKE COUNTY.

**SILVER KING EXTENSION GOLD MINING AND MILLING COMPANY.**—Articles of incorporation have been filed by William H. King, Charles G. Horsefall, Otto Hudson, Harry M. Hadley, Noah J. Sheckell, of Salt Lake, and Orson Sanders, of Murray. The company has been capitalized at \$150,000, in shares of \$1 each, and the stock is represented in the Bernice, the Bernice Nos. 1 and 2, the Silver King extension, the Silver King No. 2 and the Louise mining claims, in Mineral Fork, Big Cottonwood district. William H. King is president, Harry M. Hadley is vice-president, Charles G. Horsefall is treasurer and Otto Hudson secretary.

#### SUMMIT COUNTY.

**ANCHOR SILVER MINING COMPANY.**—The annual election of officers of this company was held at Detroit, Mich., December 9th. Francis Smith, of Muskegon, Mich., was re-elected president; E. F. Holmes, vice-president; Harry E. Meyers, of New York City, secretary; Walter Scott, assistant secretary; W. S. McCormick, of Salt Lake City, treasurer; David Keith, Park City, superintendent and manager. Executive committee, E. F. Holmes, Richard Mackintosh, David C. McLaughlin. No date was fixed for the resumption of work in the mine.

#### TOOELE COUNTY.

**GODIN.**—R. W. Nichol, of the Electric Light group in Camp Floyd district, has gotten a 10-days' option of \$2,500, with the bond in escrow, on this group of five claims, on the West Dip, and joining the La Cigale.

#### VIRGINIA.

##### PULASKI COUNTY.

**FORNEY MINING COMPANY.**—This company met in Wytheville recently to reorganize and further develop its zinc property at Allisonia.

##### WISE COUNTY.

**G. L. CARTER & COMPANY.**—This firm, which recently purchased three of the collieries on Tom's Creek, adjacent to Coeburn, is building 200 coke ovens and a general store. Another syndicate, with headquarters in Philadelphia, Pa., is negotiating for the balance of the field.

##### WYOMING.

##### CARBON COUNTY.

**COLUMBINE.**—A strike has been made in this mine, in the Gold Hill district, by the lessees, Messrs. Bratton & Ungles. Assays are said to show the ore to be worth upward of \$300 a ton in gold and silver. The ore is being sacked for shipment.

#### FOREIGN MINING NEWS.

##### AUSTRIA-HUNGARY.

##### HUNGARY.

**RESICZA COAL MINE.**—A despatch from Budapest says that an explosion of fire damp occurred December 19th in the coal mine at Resicza, in the Valley of the Temes. A large number of men were at work in the mine, and 40 of them were killed outright. Rescuing parties entered the mine as soon as possible after the explosion, and succeeded in taking out 18 men, who were seriously injured. It is known that 27 miners are still entombed, but whether they are alive is uncertain. Efforts to reach the part of the mine in which they were working are being made, but the work of the rescuers was greatly hampered by the bad character of the wreckage and the great volume of afterdamp.

##### BRAZIL.

**ST. JOHN DEL REY GOLD MINING COMPANY.**—This company's report for the half-year ending August 31st shows that the gold obtained realized a total amount of \$314,050. Of this, expenses and the government duty absorbed \$255,420, leaving a profit of \$58,630. Bond and other interest payments required \$52,500, leaving a balance of \$6,330 to be carried forward to the next half-year's account.

##### BRITISH COLUMBIA.

##### LILLOOET DISTRICT.

(From Our Special Correspondent.)

**GOLDEN CACHE.**—The mining excitement is intense about Lillooet district. The stock of the Golden Cache group of mines started at a very low figure, and in about one month rose to \$2 a share. Now all claims in the vicinity are being eagerly bought up at a big figure by syndicates and held for a bigger figure. The mineral is free milling. The chief mine of the Golden Cache group is the Golden Eagle, the tunnel of which is in about 75 ft., and the rock runs from about \$100 to \$500 in gold to the ton.

**KAMLOOPS.**—Ten miles from Kamloops, on the line of the Canadian Pacific Railway, on Coal Hill, there is great mining activity. The mineral disclosed is chiefly copper. Rock from the Pythian assays \$100 in copper. The shaft is down 70 ft. The other claims being worked are the Iron Mask, Golden Mask, Ottawa, Lucky Strike, (bonded for \$13,000 to Welsh capitalists), Tom Thumb, Drayman, Chieftain and many others. Forty-five miles from Kamloops is the Homestake mine, which has been sold in England. Seattle people are working claims further westward near North Bend on the Canadian Pacific Railroad. Owing to these mines, North Bend has doubled in population since last summer. So far, dredging in the river has not been profitable, but work will be commenced again in the rivers, with more perfected machinery as soon as the spring opens.

##### TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

Work on the Ottawa Gold Mining Company's property and on the Silver Bell group, which adjoin one another, and which are situated on the west slope of Deer Park Mountains, in the south belt, about two miles from Rossland, is being vigorously pushed. The property of the Ottawa Gold Mining Company was formerly the Stock Exchange, but it has been capitalized for \$250,000, and possesses the distinct feature that \$50,000 has been set aside for treasury purposes, and no stock can be sold for less than par. The prospecting work already done on this property consists of stripping the ledges and cuts here and there, with the view of determining the strength and duration of the ledges and the leads. The iron heat has been traced in several places, and it is the intention of the management to begin regular development work as soon as the state of the weather will permit. The shaft of the Silver Bell is down 35 ft., and crosscutting will be commenced at a depth of 60 ft.

The officers of the Ottawa Gold Mining Company

are: George A. Pounder, president and general manager; George E. Torris, vice-president; John A. Pounder, secretary and treasurer; E. W. Lillegrain, superintendent and consulting engineer.

**WHITE BEAR.**—Considerable activity is noticeable in and around this mine. The new shaft house, 24 ft. x 60 ft., has been completed the shaft is down 55 ft. and will be continued to 100 ft. A cross-cut vein will then be run to determine the width of the vein. There is in the shaft-house a 60-H. P. boiler and a 20-H. P. hoist and pump, which can be worked to a depth of 300 ft. A force of 10 men is at work on the property. Ore has been found at the surface, and has increased in quantity and quality since sinking began. The chief promoter of the White Bear is Mr. J. W. Cole, formerly of the O. K. mine.

VANCOUVER.

(From Our Special Correspondent.)

**ALBERNI.**—There are a large number of prospects in this district, Vancouver Island, chief among them being the Alberni Consolidated claim, owned by the Dunsmuir family of Victoria. For this prospect San Francisco capitalists recently offered \$250,000, which was refused.

**PHILIPS' ARM.**—On account of the mining excitement at Philips' Arm, on the Gulf of Georgia, close to Vancouver, a map with index has just been published showing 182 claims. Four claims have been transferred to Eastern Canadian capitalists for a good sum, and 12 other smaller claims for \$110,000. A Seattle Company is proving what is now known as the White Pine property. If satisfactory, a bond of \$7,000 will be taken up.

**TAXADA ISLAND.**—About midway between Vancouver and Victoria cities the country is said to be highly mineralized, and every week fresh claims are recorded. The following new prospects were registered recently: Copper Queen, Daisy Kid, and Superior, all owned by Vancouver parties.

INDIA.

MYSORE—COLAR GOLD FIELD.

**CHAMPION REEF GOLD MINING COMPANY.**—This company's report states that the gold produced during the year ended September 30th last realized £32,500, on which royalty amounting to \$14,983 has been paid, leaving as net proceeds £287,516. The profits, after charging to capital account a proportion of the expenses in connection with new works, amounted to £154,067, exceeding that of the previous year by £14,674. Final dividend of 5s. per share, makes a total of £148,500, or 67½%. From 63,157 tons of stone stamped and 19,230 tons of tailings treated, there were extracted respectively 73,851 oz. and 4,964 oz. of gold, a total of 79,815 oz. These figures show an increase on last year's results of 13,452 tons crushed, 5,875 tons of tailings treated and 10,498 oz. of gold produced. The milling power has been increased during the year by the erection of a new battery of 40 head of stamps, bringing the present power up to 140 head. The cyanide works, designed to treat 4,000 tons of tailings per month, are completed, and were set to work early in November. The reserves of ore standing in the mine amount now to 155,000 tons, an increase on the year of 45,000 tons. The tailings also show an increase of 33,000 tons on the previous year, or a total of 113,000 tons.

MEXICO. SONORA.

**GRAND CENTRAL MINING COMPANY.**—At a recent meeting of the stockholders in London, the reports presented showed that in 3½ months under the present company a profit of £40,000 had been obtained from the property, in the Minas Prietas district. The company's mill is now working about 3,000 tons of ore a month. It is proposed to double the size of the mill and to carry on extensive exploration work, and for this purpose the stockholders voted to issue £50,000 new stock, making the total capital £300,000.

(From Our Special Correspondent.)

**SANTA ROSALIA MINING COMPANY.**—The annual meeting of the stockholders of this company of the Arizpe District was held December 15th, at San Francisco. This is the company that was organized about two years ago by John Daggett, Superintendent of the Mint, and a large number of the Mint employees, who are still shareholders. The stock, in 100,000 shares, was sold at 18c. a share, payable at the rate of 1½c. a month per share, so that it was all paid up in a year. The shares are now said to be worth 60c. each. At the meeting, 760,166 shares of the 100,000 shares were represented, and the following directors were elected: John Daggett, president; Charles G. Yale, vice-president; Hugh Tevis, secretary; John Read, James McNabe, Robert Barnett and L. R. Meade.

The superintendent of the mine, A. Abbott, was present at the meeting, and reported that all the machinery had arrived in good condition and is working well. The ledge, he said, is rich and there is \$100,000 worth of ore in sight. The president's report showed that all machinery had been paid for, that the company was out of debt and that the company had \$10,000 in bank to its credit. The first carload of ore that arrived in San Francisco recently netted over \$10,000; the second, which should reach here on December 19th, is valued at \$17,000, and another load, which is being carried by burro train to the coast, will reach here by water, and is said to assay \$1,000 per ton. A 5% dividend will be declared next month.

NEW SOUTH WALES.

**BROKEN HILL PROPRIETARY COMPANY.**—This company's statement shows that during the four weeks ending December 10th there were 30,964 tons of ore treated. The output from the refinery, on which the reports are now based, was 355 oz. of gold, 535,349 oz. of silver, 1,524 tons of soft lead and 45 tons of hard or antimonial lead. In addition there were made 311 tons of copper matte, the estimated contents of which were 32,537 oz. silver and 54 tons of fine copper.

ONTARIO. LAKE OF THE WOODS DISTRICT.

**REGINA GOLD MINING COMPANY.**—General Wilkinson, managing director of this company, at Whitefish Bay, reports that a rich strike was made in his mine recently in the third level. The assay showed a good value. The main shaft has reached a depth of 207 ft. and the vein has widened to 6 ft. The new cyanide plant for the treatment of concentrates has just been brought into operation, and the work of developing the Regina is being pushed.

SOUTH AFRICA.

TRANSVAAL.

**WITWATERSRAND GOLD OUTPUT.**—The production of the Witwatersrand mines in November is reported at 201,113 crude oz., showing a gain of 1,223 oz. as compared with October and of 5,895 oz. as compared with November of last year. This brings the total output for the eleven months ending November 30th up to 2,072,175 crude oz., which compares with 2,069,207 oz. for the corresponding period last year; 1,842,055 oz. in 1894, 1,332,116 oz. in 1893, and 950,114 oz. in 1892. Taken at the usual standard of Witwatersrand gold, the production was equal to 161,110 fine oz. for November and 1,690,895 fine oz. for the eleven months this year.

SPAIN.

**RIO TINTO COMPANY, LIMITED.**—The following are the resolutions adopted at the recent meetings of the shareholders in London:

"1. (a) That each of the existing 325,000 shares of £10 each in the company's capital be divided into two shares of £5 each. (b) That the shares resulting from the division of each of the said 325,000 existing shares be renumbered so that the shares representing that now numbered 1 be respectively numbered 1 and 325,001, and those representing that now numbered 2 be respectively numbered 2 and 325,002, and so on; and that the shares so to be numbered 1 to 325,000 be called preference shares, and those to be numbered 325,001 to 650,000 be called ordinary shares. (c) That as between the holders of the said preference shares and the holders of the said ordinary shares the holders of such preference shares shall be entitled to a fixed cumulative preferential dividend at the rate of 5% per annum on the nominal amount of such preference shares, and to no more than such dividend; and that, subject to the payment of such dividend, the residue of the dividends which, but for such division as aforesaid, and for the alterations in the company's regulations consequential thereon, would, in accordance with the company's regulations for the time being, be from time to time payable on the said 325,000 existing shares, shall be distributed as dividend among the holders of the said ordinary shares; and that in the event of any return of capital being made upon a winding-up or otherwise, the holders of the said preference shares shall, as between themselves and the holders of the said ordinary shares, be respectively entitled to receive the full nominal amounts of the said preference shares held by them respectively, and all arrears of their said preferential dividend, before any return of capital is made to the holders of the said ordinary shares, but that the holders of the said preference shares shall not be entitled to any further share in the surplus assets of the company; provided that the directors may, in any year in which in their opinion such payment may be made without prejudice to the said preferential dividend up to the end of such year, declare and pay an interim dividend on the said ordinary shares in respect of the first half of such year. (d) That the said division shall be made on May 15th, 1897, but so that the net profits of the company earned on or after January 1st, 1897, shall be appropriated as if such division had taken place on that day, and that the directors be, and they are hereby, authorized to do all such acts and things as they may deem expedient for the purpose of effecting the said division."

LATE NEWS.

**QUINCY MINING COMPANY.**—The president of this company says that the despatch from Houghton, Mich., to the effect that the management was considering the advisability of sinking a shaft on the Mesnard property is not true.

**ALASKA MEXICAN GOLD MINING COMPANY.**—This company reports the clean-up for the month of November, as follows: Period since last return, 30 days; bullion shipment, \$19,717; ore milled, 10,116 tons; sulphurets treated, 143 tons; of bullion there came from sulphurets, \$4,823; working expenses for period, \$16,966. The average yield was \$1.95 per ton of ore milled, and the average cost \$1.68 per ton. The profit realized on the bullion shipment for the month was \$2,751.

**CENTRAL OHIO NATURAL GAS AND FUEL COMPANY.**—A late despatch says Emerson McMillan, representing a syndicate of New York capitalists, made an offer on December 23d for \$1,900,000 of the stock of this company. The offer is 82½c. per dollar's worth of face value stock. As this is 7c. above the market quotations on the stock, the sale will probably be made. Last year the stock paid a dividend of 9%, and during the winter months the dividend is declared monthly. The company has no debts, and is said to have the best supply of gas in Ohio. Its wells are in Licking and Fairfield counties.

**ALLISON RANCH MINE.**—This mine, in Nevada County, Cal., which was one of the best producing mines in the vicinity of Grass Valley, is to be reopened and worked by its owners, John W. Mackay and James L. Flood. The mine in the height of its prosperity was purchased by J. B. Haggin and A. E. Davis, and was a profitable investment. In 1836 it led all Nevada County mines, and two years later it had paid more than \$3,000,000 in dividends. One day a miner's pick tapped a vein of water, and in a short time the mine was flooded. The water came in in such volume that it could not be pumped out, and the mine was abandoned. That was 28 years ago. Eight years ago Mackay and Flood secured control of the property, and now they propose to pump the water out. A pumping plant with a capacity of 1,000,000 gals. a day will be put in, and work is to begin February 1st.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 25.  
Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending December 19th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	75,288	3,635,043	3,697,687
PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending December 19th, and for years from January 1st, 1896 and 1895:			

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	42,736	3,641,972	2,791,375
Barclay, Pa.....		144,953	39,352
Beech Creek, Pa.....	69,598	2,995,444	2,897,325
Broad Top, Pa.....	6,863	368,424	
Clearfield, Pa.....	71,505	4,231,774	4,955,101
Cumberland, Md.....		13,399,122	2,866,472
Kanawha, W. Va.....	175,430	3,598,414	2,812,178
Phila. & Erie.....	855	89,066	59,723
Pocahontas Flat Top.....		*2,653,904	2,385,022
Totals.....	266,987	21,026,053	18,897,751

\* For year ending October 3d.  
† For week ending December 7th.  
‡ For week ending December 14th.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	20,306	1,200,346	753,402
Pittsburg, Pa.....	37,969	1,821,513	1,617,679
Westmoreland, Pa.....	43,080	1,874,080	1,687,075
Totals.....	101,355	4,895,939	4,058,156
Grand totals.....	368,342	25,921,992	22,955,907

Production of coke on line of Pennsylvania Railroad for the week ending December 19th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 79,450 tons; year, 3,717,325; to corresponding date in 1895, 5,855,250 tons.

Anthracite.

In answer to the question "How is the anthracite coal trade," our representative received as reply from one of the sales agents, "There is none." As a general summing up of the situation, in as few words as possible, this represents the feeling, if not the fact, in reference to the trade. Without exception, business is reported no better now than it was a week ago, with the same prices still ruling, which are said to be \$4@4.10 on board for stove, and \$4.25 alongside; other sizes in proportion. More inquiry is being received for the smaller sizes—pea and buckwheat—which are also less abundant because the restriction for December affects their production with the rest. Broken and chestnut coal are experiencing no more demand than has been noted for some time past. Retailers are doing a fairly active business since the colder weather has set in, but even they report sales to be on a smaller scale than was the custom in previous years. We referred last week to the cessation of work at some collieries from two days before Christmas until the first Monday in January, the collieries had in mind at that time being in the Wyoming Valley. We now learn that all of Coxe Brothers & Company's collieries have been shut down for the same time.

NOTES OF THE WEEK.

From a statement furnished us of the Lehigh Canal coal trade for the boating season of 1896, we note the shipments to have been derived from the following sources: From Mauch Chunk region, 186,904 tons; Beaver Meadow, 28,263 tons; Mahanoy, 4,486 tons; Schuylkill, 10,456 tons; Hazleton, 1676 tons; Upper Lehigh, 13,746 tons; Wyoming, 11,549 tons; dredging of coal dirt from the Lehigh River, in 1896, 17,821 tons; total, 275,101 tons. Of this amount the Central Railroad of New Jersey (L. & S. Division) delivered 243,198 tons at the loading pockets at Coalport, and the Lehigh Valley Railroad 14,094



tons at the same place. The total increased shipments for the year over 1895 are but 2,021 tons.

**Bituminous.**

The Atlantic seaboard soft coal trade is somewhat irregular at present. Some people appear to have quite a number of orders in hand, while others do not have so many, and the feeling generally is that trade is poor. Nevertheless tonnages keep up well, while the trade still continues its transient character. The Chesapeake & Ohio canal has closed for the winter, having carried during the year about 360,000 tons of coal.

Trade east of Cape Cod is quiet, and it is thought that the transient character of the trade shows in that locality about as much as anywhere, the different mills having felt their way all through the year. Sound business is fairly active, and a good demand comes from these points continually. New York harbor trade is unchanged, continuing fairly regular.

All rail trade keeps along in about the same volume that it has of late. Most of the producing concerns are maintaining prices, though there are reports of small cuts, just enough to take trade. Transportation from mines to tide is quite slow, the snowstorm having seemingly interfered considerably with the arrival of coal at shipping ports. Car supply was a little slow at the beginning of the week, but has improved.

In the coastwise vessel market vessels are scarce, and if transportation were better, would be in considerable demand; as it is, freights are strong at current rates.

We quote current rates of freight from Philadelphia as follows: To Boston, Salem, Portland and Portsmouth, 75c.; Providence, New Bedford and other Sound Ports, 65c.; Wareham, 80c.; Lynn, 85c. @ \$1; Newburyport, 90c. Ten cents above these rates are asked from Norfolk, Newport News and Baltimore.

The association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 2c. differential in favor of Clearfield and Beech Creek coals.

**Buffalo.** Dec. 24.

(From Our Special Correspondent.)

There is but little new to communicate relative to the anthracite coal trade. Business is anything but active and prices are nominally as per schedule published many weeks since.

Bituminous coal is quiet, buyers having the advantage of sellers in all deals, although prices are reported without change. Manufacturers are just about kept going with orders.

The weather for several days has jumped from warm to cold and then back again. A couple of bitter cold days and nights benefited the coal merchant. The port of Buffalo is still open. Occasionally a grain vessel arrives, and, after discharging her cargo, leaves for home destination to lay up until next season's navigation opens.

Accounts from the principal points in the United States, East, West and Northwest, trade in coal generally is anything but satisfactory to dealers, and correspondents of the coal journals do not write in glowing terms of this great interest. Presume the coal trade, like so many other trades, is still suffering from inaction produced by the uncertain condition of affairs especially financially and politically.

**Chicago.** Dec. 23.

(From Our Special Correspondent.)

**Anthracite.**—Business in anthracite coal has been slightly better, owing to the colder weather. Orders have come in for a somewhat larger tonnage, but they scarcely exceed a few cars that in the aggregate foot up a tonnage that to the average dealer looks very small compared with a good all-around week for this time of the year. Business transacted so far in December has been very far below the average, and if it does not pick up between this and the end of the month the aggregate tonnage placed will be less than any other December in years. November was a very bad month, one of the poorest on record, but December promises to be still worse. Dealers continue to hope for weather in which the thermometer will seek the zero notch, for when such is at hand people are driven to buying coal. Despite the bad business prices are becoming somewhat steadier, though there is yet a tendency observed to cut. Retail business has been a trifle better, but prices are very much against any great increase. Prices are Chicago for carload lots: Grate \$5.60 per ton; egg, stove and chestnut, \$5.85.

**Bituminous.**—Soft coal has fallen off somewhat in demand, presumably from the quieter industrial condition due to the near approach of the holidays. There is a great amount of soft coal in the yards and on the tracks in this city and accordingly prices are not as strong as have been prevailing.

**Shanghai, China.** Nov. 20.

(Special Report of Wheelock & Co.)

**Coal.**—Beyond the ordinary supplies to contractors and consumers there has been absolutely nothing done in Japan coal, and no demand exists. There has been an inquiry for Cardiff, but business has not yet come to pass. We are informed that rates of freight on this coal have advanced to 30s. per ton, in which case consumers of this quality may have to pay much higher prices. We, therefore, venture to alter our quotation to 13 taels per ton, although no transactions have been made. In

Sydney Wallongong everything is slack, and judging from the deliveries sales must have been of a very limited nature. On November 17th 1,000 tons arrived, which are still for sale. The market at the close is very weak.

We quote: Cardiff, 13 taels per ton; American anthracite, 9 taels per ton; Sydney Wallongong, 6-75 taels per ton. Japan coal is 5-75 taels for Takasima lump, 5 taels for Namazuta lump and 4@4-25 taels per ton for other sorts.

**Kerosine Oil.**—During the past two weeks there has not been as much done as usual, Russian being more sought after, no doubt owing to the high price of Devoe's, which is being kept up by holders on account of there being several "short" sellers, and until they are satisfied we cannot see much legitimate business. Stocks at present are as follows: Devoe's, 440,000 cases; Russian, 102,000 cases; Langkat, 5,000 cases.

Quotations are as follows, per case: American Devoe's, 1'83½ taels; Russian Batoum, 1'64 taels; Russian Batoum, bulk, 1'56 taels; Langkat, 1'60 taels.

**IRON MARKET REVIEW.**

NEW YORK, Thursday Evening, Dec. 24, 1896

**Pig Iron Production and Furnaces in Blast.**

Fuel used.	Week ending		From Jan., '95.	From Jan., '96.
	Dec. 27, 1895.	Dec. 24, 1896.		
Anthracite.	59	38,630	29	16,950
Coke.....	162	184,150	99	1,280,427
Charcoal....	23	5,450	20	122,550
				7,769,330
				222,295
<b>Totals....</b>	<b>244</b>	<b>227,630</b>	<b>148</b>	<b>144,750</b>
				9,249,052
				8,665,479

Pools—pools—pools—this has been the sum and substance of the talk of the iron market this week. The steel pool held a protracted meeting in New York in the early part of the week, which was covered with profound secrecy. That is, nothing concerning the meeting was given out for publication, but from all accounts which could be obtained the conference was of a very unsatisfactory kind. The Bellaire Steel Company, which is accused of being a factor in the recent break-up, was not represented, and the meeting seems to have dissolved itself into a sort of general squabble, the position being Carnegie against the field. Nothing was concluded and the meeting ended with an adjournment to Philadelphia and there with a reference of the whole matter to the executive committee. A despatch from Pittsburg to-day says that the matter has been settled and that the pool is to be reconstituted on the allotment basis, with a minimum price to be fixed. The despatch is not as definite as it might be, however, and a satisfactory statement is yet to be made. Even if the agreement has been definitely settled, the allotments still remain to be worked out, and we all know how many pools have gone to pieces on that very point.

Meantime there is another difficulty in the way. Buyers of billets have not been slow to see their opportunity, and during the two weeks of the break in the pool have been busy making contracts for material at the best prices they could get. How good these have been will be seen when we say that there is authority for asserting that a large quantity of billets has been contracted for on the basis of \$15 per ton at mill, or from \$17@17.50 per ton for Eastern and tidewater delivery. It is impossible to say just how much steel is covered by the contracts made, but there is good authority for putting it at considerably over 300,000 tons, and probably 350,000 tons would not be over the fact. Not all of this, of course, has been taken on the \$15 basis, but all of it has been placed at figures a good deal below anything which a reconstituted pool is likely to agree on. Of course, a pool price will have very little effect until these large contracts have been worked off.

The announcement of the price of \$25 per ton at mill for steel rails, standard sections, for 1897 delivery is confined. Railroad men, however, do not seem to be very grateful for the concession accorded them, and a good many say that in view of the low prices of raw materials \$22 would have been nearer the mark. Girder rails will be the same price for standard sections, that is up to 7 in. The rail pool, wise in its generation, has settled all its difficulties very quietly, and seems to be on as stable a basis as ever.

The beam pool also seems to have gotten itself into satisfactory shape, and the probability is that prices will be fairly maintained throughout the present season. This is rather important, in view of the quantity of structural work which is coming forward in all parts of the country.

Considerable amusement has been caused in the iron market by a certain prominent New York evening paper, which in a lengthy editorial takes the pains to make an elaborate comparison, extending over a number of years, between the prices of new rails at mill and of old iron and steel rails. The point of this, the learned editor expresses in the following quotation: "Unfortunately for the railroad companies, they do not now have any considerable portion of old iron rails, but are overburdened with old steel rails, for which the price has been, during last year, not far from \$10 per ton. On this basis the excess of the new material over the old is \$18 per ton, and the ratio 180%. If the manufacturers could in the years from 1888 to

1891 convert old iron into new steel for something like \$7, they ought surely, by this time, to have found a way of converting old steel into new for a great deal less than \$18." The point of this will be quite evident to those manufacturers who have been in the habit of making their steel out of old iron rails. If the learned editor would give us the benefit of his new method the trade would be correspondingly grateful.

Outside of pools trade cannot be said to be in a flourishing position. The buying which we have mentioned has been altogether spasmodic and abnormal, and has been induced by the chance of obtaining extremely low prices—so low that they would pay for the risk of carrying the material. We all hope for better things in 1897, but unfortunately we cannot feel too confident just now.

**New York.** Dec. 24.

The local market is in a somewhat curious condition, the excitement over the steel pool and other troubles having to some extent overcome the dullness which generally precedes the holidays, and having also counteracted partly the effect of the financial depression following the Cuban idiocy of the Senate. Several of our local and Eastern concerns which use steel billets have made contracts for a considerable part of their 1897 supply, and therefore feel in a position to be independent of the pool, whatever happens. The fact that a good many of the foundries in this district have postponed to this late day the closing of their contracts for next year has also helped business, since there has been considerable buying of pig iron, as noted below. All this purchasing, however, has not helped to sustain prices, and there is no doubt that a good many contracts will be made at points below quotation, dealers being unwilling to let a good customer go and not feeling confident enough of the future to be stiff over prices. Altogether the year closes with the market in a rather unsatisfactory position, and everybody is hoping against hope for a better opening in January.

No contracts have yet been given out for the expected street railroad work. It is certain now that the Metropolitan Traction Company will be in the market for a considerable amount of rails, and of other material, probably for underground electric conduits. The Third Avenue Company will also want the material for its Kingsbridge extension and for the rebuilding of the Boulevard line, and considerable work will be done north of the Harlem River on the new trolley lines there. Local concerns hope to get a fair share of this work.

**Pig Iron.**—There has been some business, both for foundry contracts and for speculation, but generally at prices shaded a little. Agents are not willing to drop quotations, but there is no doubt that good orders are not allowed to pass on a question of 25c. a ton or so. Some predict a stiffening with the new year, but this is doubtful.

For Northern iron we quote: No. 1 foundry, \$12.50 @ \$13; No. 2 foundry, \$11.50 @ \$12; No. 2 plain, \$11 @ \$11.50; gray forge, \$11 @ \$11.50. For Southern iron we quote: No. 1 foundry, \$11.75 @ \$12; No. 2 foundry, \$11 @ \$11.50; No. 3 foundry, \$10.50 @ \$11; No. 1 soft, \$11 @ \$11.50; No. 2 soft, \$10.50 @ \$11; forge, \$10.50 @ \$11; tasic pig, \$11.50 @ \$11.75. All prices are for tidewater delivery.

**Cast-Iron Pipe.**—No new contracts are reported. Orders for Spring delivery are talked about, but only one or two small ones for New England towns have been brought out yet.

**Spiegeleisen and Ferro-Manganese.**—There have been no sales to be noted. Ferro-manganese is quoted at \$46.50 @ \$47 for imported 80%. New York.

**Steel Billets and Rods.**—The condition of the Steel Billet Pool, referred to elsewhere, makes a very uncertain market. Nevertheless, sales have been large, and many contracts for next year's deliveries have been placed. It is understood that some contracts have been taken as low as \$17.50 for tidewater deliveries. Prices have ranged from that point up to \$19.50.

**Merchant Iron and Steel.**—Business continues quiet with chiefly small sales. Prices show no change. For bars we quote: Common, 1'10 @ 1'15c.; refined, 1'20 @ 1'45c.; soft steel bars, 1'20 @ 1'30c. Other quotations are: Steel hoops, 1.50 @ 1'40c.; steel axles, 1'60 @ 1'75c.; links and pins, 1'60 @ 1'70c.; tire steel, 1'80 @ 1'90c.; spring steel, 1'95 @ 2'15c. All prices are for delivery on dock New York. More sales of cotton ties are reported at low figures, 58 @ 60c. per bundle, delivered at a Southern port.

**Plates.**—Sales are small, and, without quotable changes, prices are firm. We quote for universal mill plates, 1'30 @ 1'40c. For steel plates we quote: Tank, 1'25 @ 1'35c.; boiler shell, 1'45 @ 1'55c.; good flange, 1'60 @ 1'75c.; firebox, 1'90 @ 2'40c. Charcoal iron plates are quoted 2'25c. for shell, 2'75c. for flange, and 3'25c. for firebox. Rivets are 2'15 @ 2'25c. for steel and 3 @ 3'25c. for iron.

**Structural Iron and Steel.**—Local contracts continue to come on the market. No change in prices is noted. We quote for angles, 1'25 @ 1'35c.; tees, 1'60 @ 1'65c.; channels, 1'70 @ 1'80c. The price of beams, New York delivery, has been fixed at 1'75c. for ordinary sizes, 1'85c. for 20-in., and 1'95c. for 24-in., large lots. Smaller orders are 0'10 @ 0'20c. higher.

**Steel Rails and Rail Fastenings.**—The price of \$25 per ton at mill for 1897 delivery is confirmed. This will make standard sections \$26 per ton for tidewater deliveries. For girder rails the price

will be \$25 per ton at mill up to 7 in., with \$27 for larger sizes.

Rail fastenings are in moderate demand. We quote for angle-bars, 1 1/2 x 1 1/2 in.; spikes, 1 1/2 x 1 1/2 in.; bolts, 1 1/2 x 1 1/2 in. for square nuts, and 1 1/2 x 2 in. for hexagon nuts.

**Wrought-Iron Pipe.**—Orders are coming in fairly well for small lots. Discounts are as follows for plain pipe, out of store: 1 1/2 in. and over, 67, 10, 10, 10 and 5%; 1 1/4 in. and under, 57, 10, 10, 10, 10 and 5%. Galvanized pipe, 1 1/2 in. and over, 55, 10, 10, 10 and 5%; 1 1/4 in. and under, 50, 10, 10, 10, 10 and 5%. Boiler tubes, 1 in. to 2 1/2 in., 70, 10 and 5%; 2 1/2 in. up, 75 and 5%. Cold-drawn seamless steel tubes, 60%.

**Nails.**—The market is steady and sales are increasing. A fair quotation for wire nails is \$1.50@ \$1.55, Pittsburgh, equivalent to \$1.70@ \$1.75, New York, for large lots. For cut nails, \$1.40@ \$1.45, Pittsburgh, is the general quotation. The manufacturers seem to have settled on these quotations very generally, and little or no cutting below them is reported.

**Old Rails.**—Old iron rails are quoted \$12.50@ \$13.50, New York, with hardly any offered. Old steel rails are quoted \$10.50@ \$11.50, with few sales. Old steel rails fit to relay, standard sections, can be had at \$19@ \$22, New York harbor delivery, according to condition. Old wrought-iron pipe is quoted \$7.50@ \$8 per ton.

**Scrap Iron.**—Some sales are reported, with a moderate inquiry for good lots. We quote for good machinery scrap \$10.50@ \$12 per ton; ordinary cast scrap, \$8@ \$9.50; stove-plate and mixed, \$6.50@ \$8. Some sales of old car wheels are noted at \$11@ \$11.50 per ton, New York delivery.

Chicago, Dec. 23.

(From Our Special Correspondent.)

**Pig Iron.**—Business in pig iron continues rather quiet, and in all probability there will be no increased demand until after the first of the year. Sales in both Northern and Southern iron have been entirely for small quantities, varying from a carload up to a couple of hundred tons. There has been a considerable amount of inquiry received within the past few weeks relative to deliveries after the first of next year, but business on these does not materialize. Northern iron prices are quite strong, and there are no present indications of any cutting being done. Southern iron is not quite so firm though there is a tendency observed to stick to prices. Quotations are as follows: Lake Superior charcoal, \$13.50@ \$14; local coke foundry, No. 1, \$11.75@ \$12.25; No. 2, \$11.25@ \$11.75; No. 3, \$11@ \$11.25; local Scotch foundry, No. 1, \$11.75@ \$12.25; No. 2, \$11.25@ \$11.75; No. 3, \$11@ \$11.25; Southern coke, No. 1, \$12.10@ \$12.50; No. 2, \$11.40@ \$11.90; No. 3, \$10.90@ \$11.40; Southern, No. 1, soft, \$11.65@ \$12.10; No. 2, soft, \$11.15@ \$11.40; Southern silveries, No. 1, \$11.15@ \$11.65; No. 2, \$10.90@ \$11.15; Ohio silveries, No. 1, \$15@ \$15.55; No. 2, \$14.50@ \$15.05; Ohio strong softeners, \$14@ \$14.28; Alabama car wheel, \$16.25@ \$16.75; coke, Bessemer, \$13@ \$13.50.

**Bar Iron.**—Sales are few and all for small quantities. The Bar Iron Association met in this city during the week, but no business of importance was transacted. Common iron is quoted 1 1/2@ 1 3/4.

**Steel Rails.**—There is practically no business being transacted in rails. There has been some talk of the price of rails being reduced, but present Chicago prices remain the same, \$29 per ton.

**Billets and Rods.**—Business in billets or rods during the past week has been very limited. The agitation concerning prices has paralyzed business for the time being. The nominal quotation of billets at this point remains as before, \$21.25.

**Structural Material.**—General business remains light. There are a few inquiries regarding railroad bridges in the market. A much better business is looked for after the first of the new year. Quotations are: Beams and channels, 1 1/2@ 1 3/4; angles, 1 3/4@ 1 3/4; tees, 1 1/2@ 1 3/4.

Cleveland, Dec. 23.

(From Our Special Correspondent.)

**Iron Ore.**—The activity of the iron ore market during the past week consisted of a few small sales, with special reference to certain mixtures. The movement of ore is now entirely toward the furnaces, no more ore being brought from the upper lakes to Cleveland. Ore agents are getting ready for the business of next year, but it is not expected that the business done during the first few months of 1897 will be a criterion of the volume of business that will be done during that year. It is their opinion of the ore agents of Cleveland that it will be several months before a safe estimate can be made of the ore movements of 1897. The quotations follow: Standard hard speculars, Bessemer quality, \$4.50@ \$5; standard hematites, Bessemer quality, \$4@ \$4.25; standard hard hematites, non-Bessemer quality, \$3.50@ \$4; standard soft hematites, non-Bessemer quality, \$2.50@ \$3.25.

**Pig Iron.**—The market has been very dull during the last 10 days, so far as sales are concerned, but a more active inquiry had been developed, much to the gratification of the sellers. The prevailing opinion among the buyers seems to be that prices are lower than they will be after the first of the new year. No changes in the quotations are reported for the week. They are as follows: Lake Superior charcoal, \$13.50; Bessemer, \$11.75@ \$12.25; No. 1 foundry, \$12.15; No. 2, \$11.65; No. 1 Ohio Scotch, \$12.15; No.

2, \$11.65; Mahoning and Shenango Valley neutral mill irons, \$10.75; Mahoning and Shenango Valley red short mills, \$10.75.

Philadelphia, Dec. 24.

(From Our Special Correspondent.)

**Pig Iron.**—As regards daily trade conditions, there is very little that can be said. Brokers report very little new business since Monday morning. Late last week inquiries were made by three or four large foundry concerns, but not with reference to immediate supplies. On Monday two or three brokers were asked for figures on standard brands, one inquiry being for Virginia iron. The week has not been productive of anything. Bessemer pig producers are counting on large sales in January. No. 1 Foundry is \$12.75@ \$13.25; No. 2, \$12@ \$12.50; Forge, \$10.75@ \$11.50.

**Steel Billets.**—The exciting events in other markets are reflected here. Several large transactions were quickly and quietly closed almost immediately on the announcement of the dissolution of the former agreement. This week less has been done, but buyers are aroused, and brokers and agents say there will be big sales soon. Prices are said to be very much unsettled.

**Merchant Bars.**—There is very little business in a large way. Car lots are not being taken, though there is more talk in that direction than there has been for months. Refined is 1 1/2@ 1 3/4; steel bars, 1 1/2@ 1 3/4 and upward.

**Skelp.**—The manufacturers believe they will have some business to show in January for long waiting.

**Sheets.**—Store sales in small lots keep up very well, considering the time of year.

**Pipes and Tubes.**—Pipes are not receiving much attention, but work that calls for tubes has been coming along quite nicely.

**Merchant Steel.**—Hardware manufacturers, implement and tool makers are evidently getting into shape to do some buying in January.

**Plates.**—While our plate mill men do not report more orders going to mill, they do say that things are shaping up right for large orders early in the new year.

**Structural Material.**—The new agreement has brought matters to a focus. Figures were asked on Monday for three or four jobs. Other encouraging indications are in sight.

**Steel Rails.**—The drop to \$25 does not meet with the heartiest endorsement of rail buyers or railroad men. They think there is still too much margin between the raw material and the product. Some business is reported by our local officers, and the statement is given out that very large orders are likely to be placed next month.

**Old Rails.**—Some stock was offered at \$14.

**Scrap.**—The scrap dealers are only waiting for the year to close to drive trade.

METAL MARKET.

NEW YORK, Friday Evening, December 25th, 1896. Gold and Silver.

Prices of Silver per Ounce Troy.

December.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.	December.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.
19	4 7/8	29 1/2	65 1/4	.505	23	4 7/8 1/4	30	63 3/4	.506
21	4 7/8	29 1/2	65 1/4	.505	24	4 7/8 1/4	29 1/2	65 1/4	.505
22	4 7/8 1/4	29 1/2	65 1/4	.504	25	.....	.....	.....	.....

Owing to Indian holidays and also to the Christmas season there is a lull in the silver business. Orders for the English Mint were executed at 30d., and subsequent offerings are in request only at 29 1/2d. The market closes quiet.

The United States Assay Office in New York reports the total receipts of silver at 51,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States ports, December 24th, 1896, and years from January 1st, 1896 and 1895:

Month.	Coin and bullion.		In ore.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Nov. 1896.	\$423,399	\$7,347,547	\$44,611	\$143,072	E. \$7,022,619
1895.	56,336,938	100,197,486	183,611	1,736,048	E. 45,412,895
1896.	89,123,976	31,228,288	355,223	1,747,439	E. 56,503,172
Nov. 1896.	4,974,411	1,776,699	148,242	1,338,333	E. 2,007,611
1895.	56,209,791	11,224,776	892,120	16,069,371	E. 29,807,864
1896.	48,673,616	10,402,518	272,120	11,399,855	E. 29,143,363

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

**Gold and Silver Exports and Imports, New York**  
For the week ending December 24th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

We'k	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1896.	\$57,940	\$22,448	\$581,362	\$46,224	E. \$573,630
1895.	40,801,438	76,629,952	36,247,778	3,647,264	E. 3,128,000
1894.	71,009,850	29,094,060	37,396,832	1,617,921	E. 77,694,707
1893.	95,158,304	16,494,031	33,866,901	1,689,847	E. 110,841,227
1892.	74,822,149	63,017,178	33,797,533	3,195,644	E. 40,407,160
1891.	71,196,786	8,518,586	23,295,916	3,057,768	E. 82,916,348

Of the gold exported for the week \$1,440 went to Germany, and the balance to the West Indies; of the silver, \$28,362 went to South America, \$306 to Germany, and the balance to London. The gold and silver imported went to South America and the West Indies.

Average Monthly Prices of Silver

in New York and London, per ounce Troy, from January 1st, 1896, and for the years 1895 and 1894.

Month.	1896.		1895.		1894.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January.	30 69	67 13	27 36	59 69	30 81	66 63
February..	31 01	67 67	27 47	59 90	29 18	63 43
March .....	31 34	68 40	28 33	61 98	27 22	59 49
April .....	31 10	67 92	30 39	66 61	28 95	62 92
May .....	31 08	67 85	30 61	66 75	28 69	62 96
June .....	31 46	68 69	30 47	66 61	28 68	62 59
July .....	31 45	68 75	30 48	66 75	29 82	62 45
August....	30 93	67 34	30 46	66 61	28 29	61 83
September	30 19	65 68	30 54	66 90	38 88	64 14
October...	29 68	65 05	30 89	67 64	28 69	63 06
November	29 46	64 98	30 79	67 42	39 41	65 13
December.	29 70	65 24	31 40	66 47	27 72	60 43

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal .925 fine.

FINANCIAL NOTES OF THE WEEK.

Congress has fully indicated its right to be considered a disturber of business. The action of the Senate Foreign Affairs Committee in voting to present and recommend the adoption of resolutions, which, if carried into action, must inevitably lead to war with Spain, caused a general upset of prices and a halt in the development of business, from which it will take some time to recover. What senators hope to gain by such action is past finding out; certainly it does not improve their standing with the business community, and it is more than hinted that some of them, at least, have intimate relation with Wall street, and do not hesitate to take advantage of their official position in a speculative way. It is too bad that such things should be, but to a certain extent business men have themselves to blame for it. As the week closes, the beginning of the holiday recess of Congress gives us some chance of rest, and it is to be hoped that public opinion will be brought to bear in a very emphatic way during the recess.

An unfavorable impression has been produced by the failure of the Illinois National Bank of Chicago, which had been considered as one of the best banks in the West, and had been carrying a very heavy amount of deposits. The failure has been followed by the collapse of one or two smaller institutions, and to-day the breakdown of a large bank at Minneapolis is announced. There is no doubt that these failures are in part due to the unsatisfactory condition in which the agricultural interests of the West have been for several years. In the Chicago case, however, there were local causes, and to no small extent the failure is to be laid to bad banking methods and too great concessions to the speculative element. The other Chicago banks have united to prevent further trouble; if they had done so earlier the failure might have been avoided. It is an open question, however, whether the modern policy of supporting an institution in trouble is to be commended, and perhaps the Chicago people were right.

The continued large exports of merchandise are hardly a surprise in view of existing conditions, but the very slight increase in the imports is rather an unexpected result. Heavy purchases abroad had been anticipated, but do not seem to have been made. The present indications are that imports will be light for some time to come, and until the future is more settled.

There has been some difference of opinion as to whether gold exports will be resumed in January. The present indications are that they will not, unless there is a material change in conditions. The large trade balance now existing would seem to be sufficient to provide for all demands which can be made for the present, and there is little probability of any

reduction in exports or increase in imports for two or three months to come. On the other hand, the continued holding back in Europe from investments in American securities is a pretty fair indication that gold imports are hardly to be expected for some time.

The statement of the United States Treasury on Thursday, December 24th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

Table with columns: Dec. 17, Dec. 24, Changes. Rows: Gold, Silver, Legal tenders, Treasury notes, etc., Totals.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$120,243,280. Against these are held in the Treasury 9,403,246 coined standard silver dollars, and silver bullion purchased at a cost of \$110,840,034, making a total of \$120,243,280.

The statement of the New York banks—including the 65 banks represented in the Clearing House—for the week ending December 19th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

Table with columns: 1894, 1895, 1896. Rows: Loans and discounts, Deposits, Circulation, Reserve, Specie, Legal tenders, Total reserve, Legal requirement, Surplus reserve.

Changes for the week this year were increases of \$3,512,500 in loans and discounts, \$6,984,900 in deposits, \$803,500 in specie, \$2,811,100 in legal tenders and \$1,668,375 in surplus reserve; decreases were \$44,200 in circulation.

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 is made with the holdings at the corresponding dates last year:

Table with columns: Gold, Silver, Total. Rows: Asso. Banks of New York, Bank of England, Bank of France, Imp. Bank of Germany, Austro-Hungarian Bank, Netherlands Bank, Belgium National Bank, Bank of Spain, Bank of Italy, Imp. Bank of Russia.

The return for the Associated Banks of New York is of date December 19th; all the others are of December 24th, except the Bank of Italy, November 20th, and the Bank of Russia, November 16th-28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to December 10th are reported by Messrs. Pixley & Abell's circular as below:

Table with columns: 1895, 1896, Changes. Rows: India, China, The Straits, Totals.

Arrivals for the week this year were £176,000 in bar silver from New York and £29,000 in Mexican dollars from the same port; a total of £205,000. Shipments for the week were £67,400 in bar silver to India and £20,000 to Japan; also £26,000 in Mexican dollars to Penang, a total of £113,400.

The foreign merchandise trade of Great Britain for the 11 months ending November 30th is given by the Board of Trade returns as below:

Table with columns: 1895, 1896. Rows: Imports, Exports, Excess, imports.

The returns show for this year an increase of £18,553,717, or 4.9% in imports; of £8,551,703, or 3.3% in exports; and of £10,002,014, or 8.5% in the excess of imports.

in exports; and of £10,002,014, or 8.5% in the excess of imports.

The movement of gold and silver in Great Britain for the 11 months ending November 30th is given by the Board of Trade returns as follows:

Table with columns: GOLD: Imports, Exports, Excess. SILVER: Imports, Exports, Excess. Rows: 1895, 1896.

Gold imports from the United States this year were £3,167,231, against £8,821,006 last year. Exports to the United States were £10,528,382, as compared with £3,276,899 last year.

Domestic and Foreign Coins.

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

Table with columns: Bid, Asked. Rows: Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twenty marks, Spanish 25 pesetas.

Other Metals.

Copper.—The market has remained rather dull and depressed. Manufacturers have shown no desire whatsoever to enter the market, as orders are coming in very slowly indeed, and in the meantime prices have eased off somewhat. Several sales of Lake copper from first and second hands are reported at 11 1/2c., which were followed on the 23d by a transaction on the New York Metal Exchange for 50,000 lbs. at 11.30c.

For electrolytic copper decidedly better prices have been realized, and we have to quote for cakes, wirebars or ingots 10 1/2c. to 10 7/8c., and for cathodes 10 1/2c. to 10 3/4c. Business in casting copper was of a retail character at about 10 1/2c. to 10 3/4c. according to brand and quantity. Exports during the present month will no doubt again be very large, to judge from the deliveries which have so far been made, but no new business has as yet been reported for export, as the foreigners still decline to pay present values.

The first annual report of the Anaconda Copper Mining Company, ending June 30th, 1896, has now been issued, and is commented upon elsewhere. It appears that the average price at which they marketed their copper was 10c. delivered.

In London g. m. b. were dealt in on the 21st inst. at £49 7s. 6d., since which time the market hardened from day to day, and on the 24th g. m. b. spot was quoted £48 17s. 6d. to £49, and three months prompt \$49 10s. to \$49 12s. 6d., after which the market closed for the Christmas holidays. Business in refined sorts was small, as is usual at this time of the year, and we quote: English tough, £51 10s. to £52; best selected, £52 to £53 10s.; strong sheets, £60; India sheets, £56 to £57; yellow metal, 5 1/2d.

Tin.—The market has been rather dull, and sales could only be effected with difficulty, the more so as the slightly higher prices asked failed to induce buyers to lay in stocks. Consequently business has been rather quiet, and we quote 12.90c. for spot and futures.

The market abroad opened at £57 15s. for spot, or 5s. higher than last week's closing figure, and since then the market has been rather firm although transactions have not been large. The closing quotations are £58 to £58 2s. 6d. for spot and £58 17s. 6d. to £59 for three months prompt.

Lead.—Not much business has been doing during the week, but prices remain very firm at 3.02 1/2 to 3.05c., with only small offerings. Refiners especially are holding back, and appear to have only very small stocks. In St. Louis several transactions have taken place at 2.75c. for common and up to 2.80c. for desilverized.

The foreign market is steady but dull at £11 10s. to £11 11s. 3d. for Spanish and 5s. higher for English.

Spelter is very flat, and values have again declined somewhat. The demand is poor, and sales are reported at from 4c. to 4.05c. in New York. In the West prices have been rather irregular at 3.75 to 3.85c. St. Louis.

Good ordinary brands are quoted in London £17 10s. to £17 11s. 3d. and specials 2s. 6d. more.

Antimony.—There is no change to report, and prices are about the same as last week: Cookson's, 7 1/2c.; United States Star, 7c., and Hallett's, 6 3/4c.

Nickel.—Sales have been fair, and prices are unchanged. We quote for ton lots 33 to 36c. per lb., with 37 to 39c. for smaller orders. London prices are steady at 14 to 15d. for large orders and 15 to 16 1/2d. for small lots. The New York price is about on a parity with London, allowance being made for the duty of 6c. per lb. here. The Paris quotation is 4 fr. per kilo, equivalent to about 36c. per lb.

Platinum.—Demand is steady and prices are firm at \$14.50 to \$15.50 per oz., New York. London quotations are 57s. 6d. to 59s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for

orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 50c., 51c. and 52c. per gram. Wire and foil are 47c., 48c. and 49c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—The New York quotation is unchanged at \$36.75 per flask. The London price is £6 12s. 6d. per flask, with £6 10s. to £6 10s. 6d. named from second hand.

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Table listing prices for Aluminum, Bismuth, Phosphorus, Platinum, Tungsten, Tungstic acid, Ferro-tungsten.

Variations in prices are chiefly on size of order.

Average Monthly Prices of Metals

In New York since January 1st, 1896, and for the year 1895, 1894, 1893 and 1892; in cents per pound.

Large table with columns: Month, 1896, 1895, 1894, 1893, 1892. Rows: Copper (Lake), Tin, Lead, Spelter.

Imports and Exports of Metals.

Table with columns: New York, Week, Dec. 17, Year, 1896. Rows: Aluminum, Antimony ore, Brass, Copper, Iron ore, Iron pyrites, Nickel, Steel, Tin and black plates, Zinc.

\* Metal Exchange Reports. † Week ending Dec. 24.

Baltimore.**	Week, Dec. 17.		Year, 1896.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, cases.....				52
Chrome ore..... long tons				4,802
Copper, fine..... "	1,125		34,213	
" matte..... "			500	
" sulphate..... "			2,539	
Iron ore..... "		2,953		336,832
" pigs, bars, ingots, blooms..... "	140		960	10,570
Iron oxide..... bags				300
" pyrites..... long tons			150	
Ferro-manga-nese..... "			1,134	1,530
Ferro-silicon..... "	359			76
Lead..... "			4,219	230
Limestone..... short "				2,743
Manganese metal, long "	52		94	9,669
Spiegeleisen..... "		64		474
Steel..... "			145	9,703
Steel wire, bundles..... "		1,155		11,231
Tin, long tons..... "	40		521	2,677
Tin and black plates, boxes				132,115
Zinc (spelter) long tons.....				796

\*\*From our special correspondent.

Philadelphia.††	Imports.	
	Week, Dec. 11.	Year, 1896.
Antimony, casks.....		102
Copper ore, long tons.....		15,710
Ferro-manganese, long tons.....		807
Ferro-silicon.....		535
Iron ore, long tons.....	3,030	237,582
" pig.....		650
" pyrites, long tons.....		7,051
" and steel scrap, long tons.....		5,798
Manganese ore, long tons.....		618
Spiegeleisen.....		12,914
Tin.....		501
Tin and black plates, boxes.....	3,020	52,911

†† From New York Metal Exchange Reports.

CHEMICALS AND MINERALS.

NEW YORK, Thursday Evening, Dec. 24.

**Heavy Chemicals.**—This market continues in the dull condition reported recently, and no change is looked for until the beginning of the new year. Alkali in particular is dull, very little business in it being done. Bleaching powder continues active and in good demand. The sodas are but little dealt in. For 1897 delivery, caustic soda, in 1,000-ton lots and over is quoted at 2c. per pound. Alkali, in bags, in equally large contracts for 1897 delivery is 70c. per 100 lbs. We quote: Caustic soda, 60%, \$2.22½@ \$2.42½; 70, 74@76%, \$2.12½@ \$2.22½ per 100 lbs. Alkali, 55%, 70@75c. for 50-ton lots and over, and 80@90c. for smaller quantities; 48%, \$1@ \$1.10 for jobbing lots. Bleaching powder, prime brands, \$1.75@ \$1.87½; Continental, \$1.62½@ \$1.75 per 100 lbs. Bicarb. soda, English, 1.75@ 2c. per lb.; American, bulk, \$1.50@ \$1.50 per 100 lbs., according to make. Sal-soda, English, 62½@ 67½c.; American, 65c. (in barrels), 80c. (in kegs) per 100 lbs. Hyposulphite of soda, prime white German, 1.65@ 1.85c. in casks; 1.75@ 2c. in kegs. English, 1.70@ 1.85c. in casks; 1.80@ 2c. in casks.

**Acids.**—The acid market at this time is firm, but quiet, with the prices still tending upward. Current business still continues light. We note several 1897 contracts just closed with large consumers at an advanced of 15c. per hundred pounds over the contract price of 1896. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid (in barrels), \$1.35@ \$1.45; in carboys, \$1.40@ \$1.60; muriatic acid, 18°, 75c.; 20°, 75@ 85c.; 22°, \$1.10 @ \$1.25, according to make and quantity. Nitric acid, 36°, \$3.25@ \$4.36; 40°, \$4@ \$4.50; 42°, \$4.50 @ \$5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 75@ 90c. per 100 lbs., 10@ 15c. higher for small quantities. Chamber acid, \$6@ \$6.50 per ton at factory. Blue vitriol, \$3.50@ \$3.75 according to grade and order.

**Brimstone.**—Two arrivals of brimstone from Sicily are reported within the past week, both cargoes having been practically all contracted for previous to their reaching this port. Spot quotations at \$22½@ \$23 are therefore merely nominal. To arrive (nearly due) is quoted at \$22½ per ton, best unmixed seconds. For January and February shipments \$21½ is asked. Thirds are obtainable at \$1 per ton below these figures. The market continues firm, but without special feature.

**Fertilizing Chemicals.**—Little change is to be noted in this market, which continues dull, with very little buying going on. Prices are about the same as previously reported. Manufacturers are staying out of the market, as they do not care to make contracts until after the opening of the new year. We quote as follows:

Sulphate of ammonia, gas liquor, \$2.12½@ \$2.15 for shipment, and \$2.17½ on spot; bone, \$2. per 100 lbs. Dried blood, high grade Western, \$1.77½ per unit New York; f. o. b. Chicago, \$1.50@ \$1.52½ per unit; low grade, fine ground, Western, \$1.45@ \$1.50 f. o. b. Chicago. Azotine, \$1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13% @ 15%, av. P<sub>2</sub>O<sub>5</sub>, 54@ 65c. per unit at seller's works, in bulk. Dissolved bone black, 17% to 18%, P<sub>2</sub>O<sub>5</sub>, 85c. per unit. Acidulated fish scrap, \$10, and

dried scrap \$19.50@ \$20 f. o. b. fish factory. Tankage, high grade, \$14.25@ \$14.50 per ton; concentrated, \$1.45 per unit f. o. b. Chicago; New York, \$19.75@ \$20.50; low grade, \$19. Bone tankage, \$19@ \$20; ground bone, \$21@ \$23. Bonemeal, \$20@ \$22.50.

Sulphate of Potash: 90-95%, New York and Boston, \$1.96½; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 103@ 105½c. basis of 48% chloride high grade (basis 90%), 109½@ 203c., in bulk, 24@ 36% per unit O. P., 36½@ 38c.

Muriate of Potash: We quote: 178c. at New York and Boston, 179½c. Philadelphia, Baltimore and Norfolk, and 181½c. Charleston, Savannah, Wilmington and New Orleans, for 80@ 85% basis of 80%, in lots of 50 tons and upward.

Chlorate of Potash.—The demand remains ample to maintain the firm tone recently noted, so that we still quote 8@ 8½c., according to quantity.

Kaolinit.—Quotations per ton of 2,000 lbs. are \$8.80 @ \$9.25 per ton for shipments; the same for bulk, ex-ship.

**Nitrate of Soda.**—Conditions are but little changed from a week ago, prices continuing firm, as follows: For spot, 190@ 192½c.; for shipment, 187½c.

**Liverpool.** Dec. 16.  
(Special Report of Joseph P. Brunner & Co.)

The chemical market is rather lethargic at present, but quotations are practically without change.

Soda ash is inquired for, but without much actual business reported. Quotations vary according to export market, and nominal range for tierces may be called about as follows: Leblanc ash, 48%, \$4@ \$4 5s.; 58%, \$4 5s. @ \$4 10s. per ton, net cash. Ammonia ash, 48%, \$3 @ \$3 10s.; 58%, \$3 5s. @ \$3 15s. per ton, net cash. Bags 5s. per ton under price for tierces. For the American market special terms would be made.

Soda crystals are without special feature, and are quoted at £2 5s. @ £2 7s. 6d. per ton, less 5% for barrels, and 7s. less for bags.

Caustic soda is quiet, but holders are not pressing sales, while outside makes are well sold over next year and it is difficult to find sellers. We quote range for any position, as to market, about as follows: 60%, £6 5s. @ £6 7s. 6d. per ton; 70%, £7 5s. @ £7 7s. 6d. per ton, net cash; 74%, £8 2s. 6d. @ \$8 5s. per ton; 76%, £8 17s. 6d. @ £9 per ton, net cash. Bleaching powder is inactive, but at the same time steady at £6 12s. 6d. @ £6 17s. 6d. per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash is held for 4½d., but the advance has checked business again.

Bicarb. soda is firm at £6 15s. per ton, less 2½% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is rather firmer at £7 12s. 6d. @ £7 15s. per ton, less 2½% for good gray, 24%, and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda ranges from £8 2s. 6d. @ £8 7s. 6d. per ton, less 2½% for double bags, f. o. b. here, as to quality, but there is little business passing on spot.

Carb. ammonia, lump, 2d. per lb.; powdered, 3½d. per lb., less 2½%.

MINING STOCKS.

Complete quotations will be found on pages 622 and 623 of mining stocks listed and dealt in at:  
New York. Colorado Springs. Paris, France.  
Boston. Duluth, Minn. Mexico.  
Philadelphia. Helena, Mont. Shanghai, China.  
Baltimore. Salt Lake, Utah. Valparaiso, Chile.  
Pittsburg. San Francisco. London, England.  
Cleveland, page 620 Denver, Colo. British Columbia.

NEW YORK, Thursday Evening, Dec. 24.  
With the year so nearly at a close and the holiday season at hand, the brokers and the mining share market do not present a very cheerful appearance. The traders are trying to content themselves by reflecting upon the business they transacted during the months just past. A few of them, optimists in their class, are looking forward to a "boom" in the market for mining securities. The public, however, which is the jury in such a case, does not seem to think so, nor will it give the matter consideration yet. Therefore we shall see little or no improvement in the conditions at present ruling for some time to come, and the year 1897 will open, as did its predecessors, with the hoped-for prosperous future still ahead.

The market for mining stocks in the West was a little better in tone than our own, and increased prices were noted in several stocks. Business, however, is not yet as active as many expected, and it does not appear as though times would be better until after the first of the year.

The San Francisco market has shown many fluctuations, and in many instances prices have ruled lower.

Tuesday of this week realized the best transactions for the New York market, and prices there were higher than they are at the close to-day.

Six stocks constituted the dealings in the Comstock group this week, showing that these old-time favorites have grown cold in the opinion of public speculators. Consolidated California & Virginia decreased in price until it reached \$1.10 last week. The other stocks show a corresponding decline in values, and their sales have been only on a moderate scale. The Comstock companies have already begun to levy assessments for 1897. Hale & Norcross announces an assessment of 25c., delinquent on January 11th, 1897; Gould & Curry, one of 15c., delinquent January 19th, while Crown Point levies an assessment for 10c., delinquent January 13th. The Crown Point Mining Company will hold

its annual meeting on January 12th, at the office in San Francisco.

What little favor was shown to mining stocks fell to the lot of Cripple Creek shares; these, however, show several declines—in one instance from 10 to 25c. We note that the Alamo Mining Company's stock has been traded in this week after an absence of nine months; it sold for 5c. per share on December 19th, the only sale recorded. At the close to-day Isabella sold for 40c., with transactions amounting to 1,000 shares. Iron Silver, a Leadville stock, was traded in this week at 30c.

The California shares had a downward tendency this week, the Bodies showing declines of several points. Standard Consolidated, which recorded its last sale on November 25th at \$1.25, was dealt in on December 22d at \$1.20; Bodie on the same day changed hands at 65c., and Bulwer at 40c. Sales, however, were not very heavy in either of these stocks. Brunswick Consolidated, a gold stock in the Grass Valley District, declined to 18c. on Saturday last, and then fell to 17c. on December 23d.

There is but little inquiry for Utah stocks at the present time. The Mercur Gold Mining Company has declared a dividend for December amounting to \$25,000. Ontario announces a dividend of \$15,000 which will be payable on December 31st. Another stock to pay a dividend in December is Centennial-Eureka—one of \$30,000.

The Alice Gold and Silver Mining Company, of Montana, has declared a dividend of 5c. per share, payable December 31st. The transfer books, which are now closed, will be reopened on January 13th.

**Boston.** Dec. 23.

(From Our Special Correspondent.)

There has been but little doing in copper stocks this week outside of the Montana stocks, which have been fairly active, with a firmer tendency. In the early dealings Boston and Montana broke off sharply from \$93 to \$88½ on the war scare, but quickly recovered and sold up \$5 to \$93½. In the last two days the market was a little heavy and the stocks touched \$91, recovering to \$92½ to-day, and closing at \$92. In Butte and Boston there is quite a speculative feeling without any material change in the price. It sold at \$1½ early in the week, declined to \$6½, recovered to 7½, and closed at \$7. Old Dominion, after selling at \$17, declined to \$15½, which was the closing price to-day.

Calumet & Hecla holds firm at \$325 on investment buying, Quincy is steady at \$119@ \$119½, closing at the former figure. The scrip sold at \$9½. Tamarack was dealt in only in a small way at \$92½ @ \$92. Osceola touched \$29 and closed at \$28½ without much activity. Kearsarge sold down to \$14½, but rallied later to 15½, with closing sale at \$15½. Atlantic sold at \$21½ for a small lot, and Franklin at \$10 for 10 shares only. Tamarack, Jr., was firm at \$13½ @ \$14. We hear good reports from this mine. Tecumseh was steady at \$3 and Wolverine at \$8½ @ \$8½. Centennial sold at \$23½ @ \$23.

The gold stocks were quiet. Pioneer sold at \$5½ and \$4½, closing at \$4½. Gold Coins declined from \$3.20 to \$3. Santa Isabel fell off from \$10½ to \$9½, with recovery to \$10. Merced was heavy and declined to \$6, a loss of \$1 per share. Boston & Cripple Creek sold at 10c., same as last week.

**Cleveland.** Dec. 23.

(From Our Special Correspondent.)

While the sales of iron mining stocks reported during the past week are few, there has been considerable shifting. Some of the stocks have gone up and others have gone in the other direction. It is the opinion of the brokers in general that within a very short time investors will begin by placing money and securing stocks in anticipation of the business to be done by the mining companies next year. The fact that the quotations have been changed considerably during the past week indicates that the iron stock market in Cleveland has taken on a new lease of life. The quotations follow:

Name of Company.	Par val.	Dec. 23.	
		Bid.	Ask.
Aurora.....	\$25	\$6.00	\$8.00
Biwabik.....	100	.....	34.00
Champion Iron Company.....	100	10.00	30.00
Chandler.....	25	37.00	40.00
Cincinnati Iron.....	25	10.00	13.50
Cleveland-Cliffs Iron Company.....	100	43.00	45.00
Jackson Iron Company.....	25	.....	70.00
Lake Superior Iron Company.....	25	.....	23.00
Lake Superior Consolidated.....	100	.....	21.00
Minnesota.....	100	65.00	65.00
Pittsburg & Lake Angeline.....	25	80.00	82.00
Republic Iron Company.....	25	16.00	.....

**Salt Lake City.** Dec. 19.

(Special Report of James A. Pollock.)

During the week just closed, the local mining stock market was almost a repetition of that for the week preceding. As a whole, the list was well sustained, but there were weak spots and buying was only normal. Indications are that with the new year will come a very material awakening among mining stock investors. All of the mortgages against the Ajax were paid during the week and the company is now practically free from debt. While the stock did not show a great deal of activity, quotations were well maintained. The old officers of the Anchor have been re-elected. Nothing is doing at the company's properties and the stock was inactive. On the 21st the Bullion-Beck will pay its triple dividend of 45c. per share. The company is making a good record of production,

Buckeye continued strong. The showing at the mines is reported to have improved. Practically no business was done in Centennial-Eureka. On the 15th the usual dividend of \$1 per share was distributed. No particular change occurred in Daly, buyers holding off until something definite is known regarding the delayed dividend. Daly-West was in its usual good demand, with only limited offerings of the stock. At the properties the ore showing is very gratifying. Dalton continued weak, with very light business, while Dalton & Lark was without activity. Galena sold lower. Geyser did no special business, although the offerings were not heavy. The company is now treating ore nearly to its new capacity. Horn Silver continues inactive. An increased demand for Lucky Bill caused a slight strengthening of that stock. Ore of fair grade is now being taken out by the company. Work has been resumed at the Little Pittsburgh. Mammoth recorded a very material advance, the close being back near the \$2 mark. Good reports from the mines and dividend expectations caused an increase in buying. Mercur was stronger, with very light offerings of the stock. Northern Light continued to advance and closed in good demand. Ontario was sluggish. Swansea recorded a slight advance and closed around the \$2.50 point. South Swansea changed but little. The company is making some very heavy shipments. Sunshine did practically nothing; the mill operations have not been resumed. Silver King was strong as usual. Utah is making some good shipments, but the stock was not specially active.

**San Francisco.** Dec. 19.

(From Our Special Correspondent.)

At the opening the market was altogether unpromising. Prices were low, demand small and everything was at the mercy of the small operators, who were apparently bound to put prices down to the zero point. Matters took a turn for the better, however, and prices began to go up a little and to show more firmness.

Dealings in the Bodies have been quite a feature this week, and Bodie Consolidated sold up to 65¢ @ 67¢; Bulwer at 45¢ @ 47¢; Mono at 22¢ @ 23¢. The absorption of these companies by the Standard Consolidated will be complete as soon as the necessary legal formalities have been gone through. After that Standard Consolidated will be once more placed on the call list here.

On Wednesday there were rumors of ore discoveries in the Hale & Norcross ground, on the Comstock, which started quite a demand for that company's stock. Later it was stated that the indications of a new ore body were strong, and there was a sharp rise. This helped some of the other stocks and made a firmer tone for the market, so that the week closes with quite a show of activity.

Some closing prices are as follows: Hale & Norcross, \$1.25 @ \$1.30; Consolidated California & Virginia, \$1.10 @ \$1.15; Ophir, 94 @ 96c.; Chollar, 85 @ 90c.; Confidence, 75c.; Potosi, 57 @ 60c.; Best & Belcher, 54 @ 58c.

The Gold Mining Exchange has been extremely quiet and dealings were very limited. The only quotations which can be noted are: Savannah, 42c.; Lockwood, 27 @ 28c.

On December 21st the California Debris Commission will give a hearing to the following applicants for permission to operate mines by the hydraulic process: C. W. & W. W. Martin, in the North Star mine, near Placerville, El Dorado County, to deposit tailings in White Rock Creek; from Stevens, McKenny & Company, in the Boulder Hill mine, near Placerville, El Dorado County, to deposit tailings in Ringold Creek; from Ah Sing, in the Hayden Hill mine, at Green Valley, Placer County, to deposit tailings in an old pit; from George W. Jones, in the Buckeye Hill mine, near Nevada City, Nevada County, to deposit tailings in a ravine; and from A. H. Holgate and others, in the Golden Gate mine, near Onion Valley, Plumas County, to deposit tailings in Winters Creek.

The Alta Mining Company of Nevada has levied an assessment of 5c. per share, delinquent January 18th.

The Gould & Curry Mining Company of Nevada has levied an assessment of 15c. per share, delinquent January 19th.

The Jamison Mining Company of Plumas County, California, has levied an assessment of 5c. per share, delinquent January 25th.

**British Columbia.**

(From Our Special Correspondent.)

**ROSSLAND, Dec. 17.**

As the holidays approach and the winter deepens mining matters in the various phases which this camp furnishes continue to remain on the quiet side so far as the business of stock selling and mining development are concerned. It is not necessarily the season for great activity in the staple business of the camp, though the local trade, stimulated as it is by railway enterprise, to say nothing of real estate, continues to be good. It would seem that the Canadian people are determined to make a great city out of Rossland if coming here and embarking in business may be regarded as the proper means to that end.

The changes made in the character of the population during the past few months is very marked; very fine residences are in course of erection in various parts of the camp and its evolution from a frontier camp to a first class community, in many respects at least, keeps pace with the development of the mines which, though interfered with, to some extent by the winter weather, is progressing as well

as it possibly can under the circumstances. Track-laying on the Red Mountain branch of the Nelson & Fort Sheppard Railway has reached a portion of the town known as the baseball ground, and a few days ago President Corbin with a select party came over the road with two coaches which were run as far as the Black Bear mine, about a mile from Rossland. Those who have charge of the preliminary work of getting things into shape on many of the mining properties which have been more or less capitalized of late are certainly pushing their work with great diligence. A visit to the various properties after an absence of a few days discloses the effects of constant activity in a very pronounced manner. One hears on all sides that the coming spring will yet see the greatest progress, both in population and development, since it is contended by those who know the camp best that with the erection of additional smelting works, capable of heating low-grade ores, there will be at least 25 paying mines in the camp by next August.

**Paris.** Dec. 13.

(From Our Special Correspondent.)

Speculation in mining stocks has been declining somewhat during the week for several reasons, chief among which is the high rate for money which has prevailed now for several weeks. As I have before written you, a low rate for loans, especially if it lasts for some time, is a great help to speculation, while an increase in the discount rate such as we have seen during the past six weeks has a corresponding effect in decreasing the movement of stocks. Again, we are approaching the end of the year when accounts are made up, and when people are rather disposed to keep out of the market until they see the result of the year's transactions. I may add that another thing, which in France interferes always with business in December, is the amount of money which in most households is considered necessary to prepare for the *Jour de l'An*. This requires some hoarding of money through December, and so the small speculators, or rather I might say the small buyers of stocks, whose purchases nevertheless foot up a very large total, are for the present out of the market.

For these reasons, and also because they had previously reached a very high figure, there has been some reaction in the metallurgical stocks. Still the fall in prices has been very slight and most of these shares have kept the greater part of their recent advances. With the present prospects for plenty of work and good dividends for the coming year there is every reason to believe that there will be no considerable fall.

The price of copper has been somewhat uncertain, and although the market reports show no increase in stocks of the metal, and even a slight diminution, there is a little uncertainty about the future. The great increase in exports of copper from your side has led people to fear that so much will be thrown upon the market as to cause a break in prices. Consequently the copper stocks are not so strong, and there have been several falls. Rio Tinto has been well maintained by the Berlin clique. The stockholders have finally approved the resolutions which authorized the division of the present shares into two parts; one to be preferred stock carrying a fixed interest and the other ordinary stock, as at present. It is thought that this change will tend to make the preferred an investment stock, while the ordinary shares remain chiefly a speculative security.

In other shares there was not very much movement. Very little was done in the zinc and lead stocks. The Russian shares still continue favorites, and there has been considerable dealing in them at high prices.

I have again to report that the weak point in the market is in the South African gold stocks. The improvement in the Transvaal has been so slow, and there are so many unfavorable reports with regard to individual mines, that investors are not at all encouraged; nor does it seem probable that economies are to be secured on the scale which is necessary to make the gold mining industry once more a profitable one to the companies. The movement to secure a better representation of French stockholders and to correct some existing abuses in management is continually gaining adherents, and it looks as if it would attain such importance as to compel attention.

AZOTE.

**MEETINGS.**

Aspen Deep Mining Company, at the office of the company, in Aspen, Colo., on January 12th, at 10 a. m.

Best Friend Mining Company, at the office of the company in Aspen, Colo., on January 12th, at 10 a. m.

Colorado & Idaho Mining and Milling Company, in Denver, Col., on January 11th, at 10 a. m.

Crown Point Mining Company, at 214 Atlas Block, Salt Lake City, Utah, on January 12th, between 12 m. and 6 p. m.

Eureka Tellurium Gold Mining Company, in Wauzh, Shasta County, Cal., on December 30th, at 2 p. m.

Gulf Gold Mining and Milling Company, at 615 Ernest & Cramer Building, Denver, Colo., on January 12th, at 2 p. m.

Louis Justice Gold Mining Company, at the Teller House, Central City, Colo., on January 5th, at 7:30 p. m.

Monte Rico Gold Mining Company, at Room 20, Bank Building, Colorado Springs, Colo., on January 12th, at 3 p. m.

Playa de Oro Gold Mining Company (Ecuador), annual meeting, at Versailles, Woodford County, Ky., January 12th, 1897. Transfer books close January 15th.

Puritan Gold Mining Company, 611 Mining Exchange, Denver, Colo., on January 14th, at 10 a. m.

Queen Victoria Gold Mining and Milling Company, at Denver, Colo., on January 12th, at 10 a. m.

**ASSESSMENTS.**

Name of Co.	Loc'n.	No.	Delinq.	Salc.	Am't.
Bay State.....	Cal.....	34	Dec. 7	Jan. 28	.05
*Butte & Phila..	Mont.....		Jan. 12	Dec. 29	.002 1/2
Comstock Sil- ver.....	Utah.....		Dec. 14	Jan. 4	.10
*Con. Cal. & Va.	Nev.....	7	Jan. 14	Feb. 4	.25
*Crown Point...	Nev.....	69	" 18	" 3	.10
Elk Mountain...	S. D.....		Nov. 30	Dec. 31	.000 1/2
Exchequer.....	Nev.....	39	Dec. 18	Jan. 11	.05
Far West G. & S.....	S. D.....	14	Jan. 9	" 30	.003
*Gould & Curry..	Nev.....	80	" 19	Feb. 9	.15
Gover.....	Cal.....	5	Dec. 28	Jan. 10	.03
*Hale & Norcross	Nev.....	110	Jan. 11	Feb. 1	.25
Last Chance.....	Ida.....		Dec. 19	Jan. 9	.01 1/2
Montreal.....	Utah.....		" 15	" 15	.00 1/4
No. Golden Gate.	Utah.....		" 21	" 22	.001
North Gould & Curry G. & S..	" .....	17	" 5	" 22	.10
Occidental Con..	" .....	25	" 29	" 18	.15
Orleans.....	Cal.....		Jan. 11	Feb. 2	.10
Overman.....	Nev.....	76	Dec. 31	Jan. 22	.10
Red Cloud.....	Utah.....	6	" 31	Feb. 1	.02
Silver King.....	Ariz.....	15	" 7	Jan. 5	.25
*Silver King.....	Utah.....		Jan. 8	" 23	.02
Snowflake.....	" .....		Dec. 29	" 22	.01

\* New assessment.

**DIVIDENDS.**

NAME OF COMPANY	Current Divi- dends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Am't.		
Aetna Con.....	Dec. 10	\$10,000	\$40,000	\$80,000
Alaska-Mexican.....			70,200	173,031
Alaska-Treadwell.....			350,000	3,025,000
*Anacosta.....			2,250,000	2,250,000
*Anchor-V-Leland	Dec. 14	6,000	18,000	30,000
Aurora Iron.....			50,000	700,000
Bangkok-Cora Bell			6,000	107,510
Big Six.....			2,500	2,500
*Boston & Mont.			1,500,000	4,925,000
*Bullion-Beck & Ch	Dec. 20	45,000	290,000	1,947,000
Calumet & Hecla..	" 17	500,000	2,500,000	46,850,000
Cariboo.....	" 7	16,000	76,410	125,410
*Centennial-Eureka	" -	30,000	390,000	1,867,000
C. O. D.....			5,000	25,000
*Coronas.....	Dec. 1	1,500	5,000	5,000
Dalton & Lark.....			87,500	87,500
Daly.....			37,500	2,887,500
Deadwood Terra..			100,000	1,240,000
De Lamar.....			53,000	2,250,000
Dominion Coal....			600,000	600,000
*Elkton Con.....	Dec. 20	20,000	90,000	169,960
Florence.....			54,300	89,312
Galena.....			50,000	61,000
*Garfield Grouse..			1,000	12,000
*Gold Coin.....			35,000	106,000
Golden Eagle.....			10,000	10,000
Golden Fleets.....	Dec. 15	5,000	162,000	263,179
Gold & Globe Hill.			19,500	28,875
Hecla Con.....	Dec. 24	15,000	45,000	2,145,000
Helena & Frisco..			60,000	475,000
*Highland.....			140,000	3,224,910
*Homestake.....	Dec. 26	31,250	375,000	6,087,500
*Hope.....	" 1	10,000	50,000	642,222
Horn Silver.....			5,000	5,130,000
Iowa.....	Dec. 15	10,000	5,000	69,000
Iron Mountain....			35,000	145,000
Isabella.....			180,000	2,250,000
Jackson.....			7,500	475,000
*Last Chance.....			20,000	20,000
Le Roi.....	Dec. 1	25,000	225,000	250,000
*Mammoth.....			60,000	1,150,000
*Mercur.....			200,000	375,000
Minnesota Iron...	Dec. -	25,000	495,000	3,240,000
Mont. Ore Pur. Co.			320,000	480,000
Moon-Anchor.....			24,000	24,000
Moose.....			6,000	186,000
Mt. Rosa.....			10,000	30,000
Napa Con.....			70,000	810,000
New Elkhorn.....			72,000	72,000
*Ontario.....	Dec. 31	15,000	180,000	13,365,000
Oseola Con.....			125,000	2,072,500
Otaqueachv.....			1,000	1,000
*Pan American...	Dec. 31	5,000	6,000	30,000
*Portland.....	" 15	30,000	24,000	863,000
Quincy.....	" 8	300,000	1,000,000	8,670,000
Sacramento.....	" 10	5,000	7,000	7,000
*Silver King.....			375,000	826,000
Slocan Star.....			200,000	250,000
Small Hopes.....			25,000	3,275,000
Smuggler-Union...			100,000	100,000
South Swansea....	Dec. 21	7,500	7,500	7,500
*Swansea.....	" 10	5,000	20,000	21,500
Tamarack.....	" 31	150,000	300,000	4,770,000
Union.....			23,500	78,000
*Utah.....			22,000	175,000
Utah Con.....			3,000	5,000
Victor.....	Dec. 15	20,000	240,000	705,000
Victor M. & L.....			12,000	42,000
War Eagle.....			55,000	187,500
Wasp.....			40,000	40,000
<b>Totals.....</b>			\$1,286,250	\$130,698,983

\* November dividend paid.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the *Engineering and Mining Journal* will confer a favor on the publishers if they will notify the *Journal* of any errors or omissions in the above table.

STOCK QUOTATIONS.

BOSTON, MASS.\*

Table of stock quotations for Boston, Mass. listing companies like Allouez, Arnold, Atlantic, and others with columns for location, par value, and prices for Dec 18-24.

\*Official quotations Boston Stock Exchange. Total sales, 29,921.

INDUSTRIAL COAL AND COAL RAILROAD.\*

Table of stock quotations for Industrial Coal and Coal Railroad, listing companies like Balt. & Ohio, Ches. & O., and others with columns for par value and prices for Dec 19-25.

\*Official quotations N. Y. Stock Exchange. Holiday. Total shares sold, 86,251.

COLORADO SPRINGS, COLO.\*

Table of stock quotations for Colorado Springs, Colo., listing companies like Ajax, Alamo, Am'ric'n C, and others with columns for par value and prices for Dec 14-19.

\* Official quotations and sales Colo. Springs Mg. Stock Assoc. \* Board of Trade Exchange.

NEW YORK.\*

Table of stock quotations for New York, listing companies like Ajax, Alamo, Alice, and others with columns for location, par value, and prices for Dec 19-25.

\*Official quotations N. Y. Stock and Con. Stock & Petroleum exchs. Total shares sold, 11,810.

SAN FRANCISCO, CAL.\*

Table of stock quotations for San Francisco, Cal., listing companies like Alta, Belcher, Best & Belcher, and others with columns for location, par value, and prices for Dec 18-24.

\*Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD.\*

Table of stock quotations for Baltimore, Md., listing companies like Balt. M. & S. N. C., Lake Chrome, and others with columns for location, par value, and prices for Dec 18-24.

\*Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA.\*

Table of stock quotations for British Columbia, listing companies like Boundy Creek, California, Camp Bird, and others with columns for name, selling price, and prices for Dec 18-19.

Par val. Hall Mines and Le Rol, \$5; Slocan Star, 50c; other stocks, \$1.

LONDON. Dec. 11.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like Nth American, Alaska, De Lamar, etc.

\* Ex-dividend. † Dividend pending. ‡ x Cap.

DENVER, COLO.†

Table with columns: NAME OF COMPANY, Par value, Dec. 14, Dec. 15, Dec. 16, Dec. 17, Dec. 18, Dec. 19, Sales. Lists companies like E'd Mines, Anconada, Bangkok, etc.

\* Official quotations Colorado Mining Stock Exchange. Total shares sold, listed, 545,424; unlisted, 434,201. Total, 1,029,625.

PARIS. Week ending Dec. 11.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices. Lists companies like Acleries de Crenost, Firminy, etc.

SALT LAKE CITY, UTAH.† Week ending Dec. 12.

Table with columns: STOCKS, Par value, Bid, Asked, Actual selling price. Lists companies like Ajax, Alliance, Ann's, etc.

\* Special Report of James A. Pollock. † All the companies are located in Utah.

MEXICO. Week ending Dec. 17.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices. Lists companies like Amistad y Concordia, Angustias, etc.

NOTE. - In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

VALPARAISO, CHILE.† Sept. 31.

Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices. Lists companies like Arturo Prat, Caracoles, etc.

\* Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

SHANGHAI, CHINA.† Nov. 15.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu M. & Trad., Funjong M. Co., etc.

\* Special Report of J. F. Bissett & Co. The prices quoted are in Shanghai taels.

PHILADELPHIA PA.†

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Sales. Lists companies like Acely's L. Co., Cambria Iron, etc.

\* Official quotations Philadelphia Stock Exchange. Total sales, 6,251.

HELENA, MONT.† Week ending Nov. 27.

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Price. Lists companies like Am. Dev. & M. Co., Bald Butte, etc.

\* Special Report of Samuel E. Davis. Total shares sold, 10,000.

PITTSBURG, PA.† Week ending Dec. 19.

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Selling price. Lists companies like Mansfield, N.Y. & C. Gas Co., etc.

\* Official quotations Pittsburg Stock Exchange.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), and Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last).

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. \* Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,330,000 in dividends and the Cons. Virginia \$42,330,000. § Dividends paid since consolidation. Note.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.



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SEE PAGE 30.

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**GOLD AND SILVER SMELTING, CONCENTRATION, CYANIDE AND CHLORINATION EQUIPMENTS** Colorado Iron Works, Page 27.

**COAL MINING MACHINERY, MINE LOCOMOTIVES, MINING MACHINES, DRILLS.** See Advt. of the Jeffrey Mfg. Co., Pages 14 & 32

**MINING MACHINERY. FRIED. KRUPP GRUSONWERK.** See Page 26.

**DIAMOND PROSPECTING DRILLS QUARRYING AND MINING MACHINERY.** See Card of SULLIVAN MACHINERY CO. Page 22

**MINING, MILLING, MARINE MACHINERY OF EVERY KIND. UNION IRON WORKS, S. F.** See Page 29.

**MINING, MILLING & HOISTING MACHINERY** SEE ADV. OF F. M. DAVIS IRON WORKS CO. Pages 22 & 24.

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An extended series of experiments is there given on the segregation of the metalloids in steel ingots, with particular reference to the homogeneity of ordinary plates and angles, and the book then goes on to show the physical properties that may be expected when structural material is tested in the usual manner and how these properties are affected by different methods of heating and rolling, and by variations in the shape and history of the test-piece.

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The manufacture of steel castings and the welding of iron and steel are also discussed.

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- III.—Wrought Iron.
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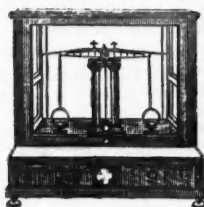


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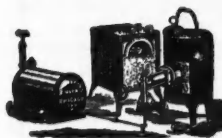
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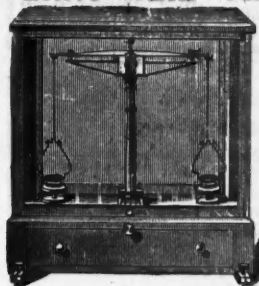
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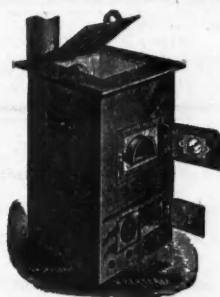
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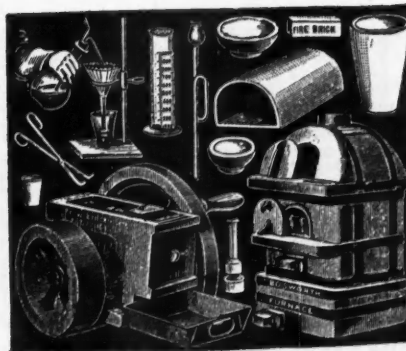
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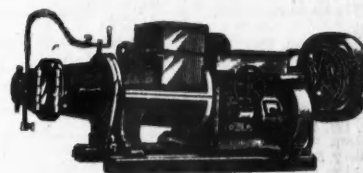
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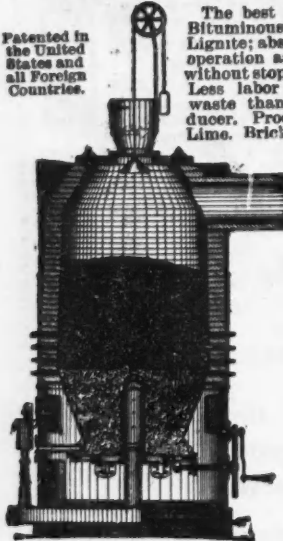
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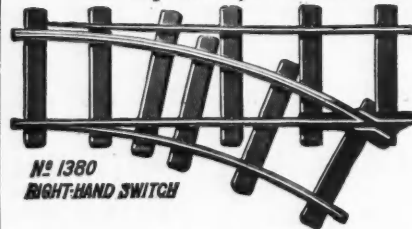


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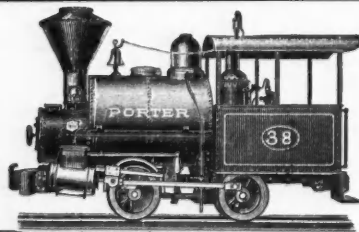
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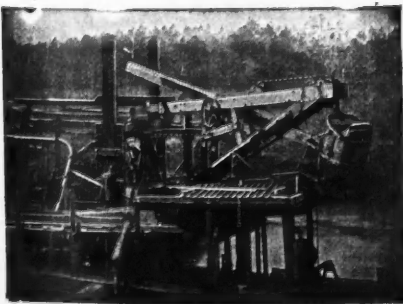
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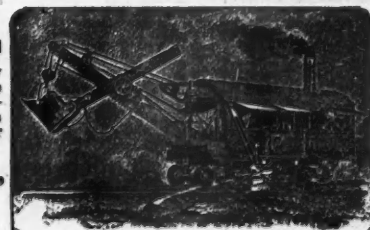
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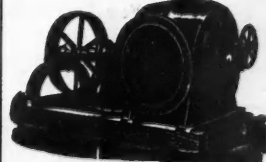


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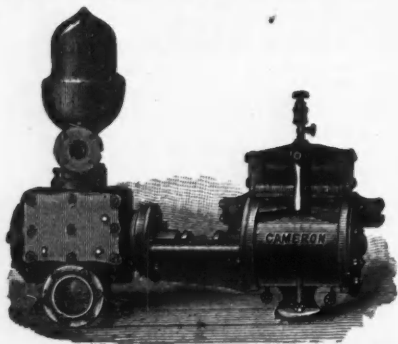


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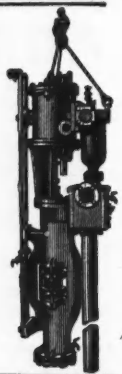


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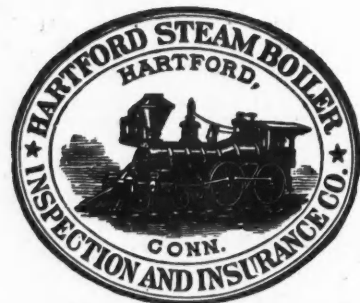


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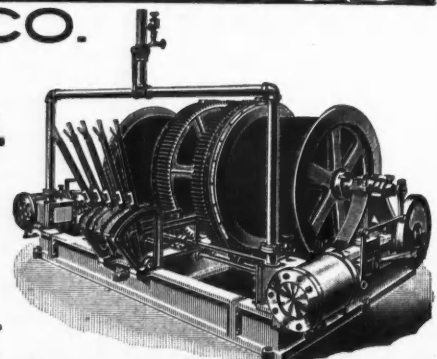
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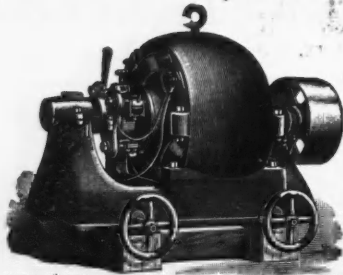
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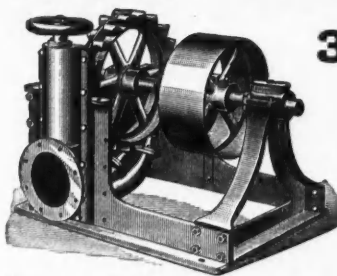
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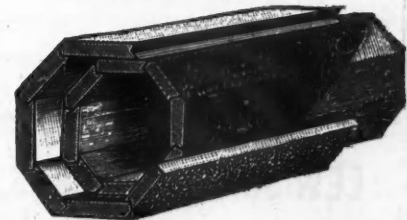
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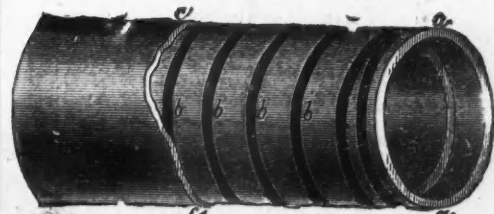
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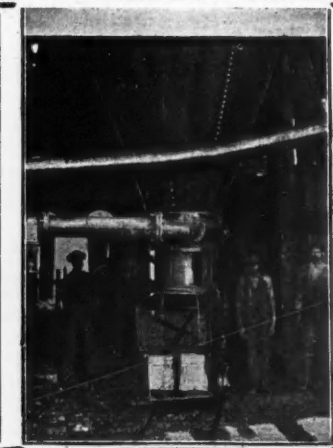
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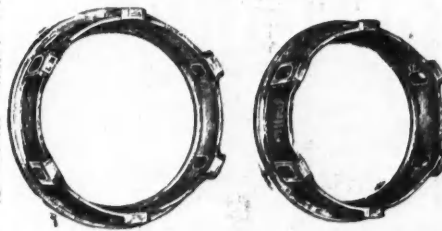
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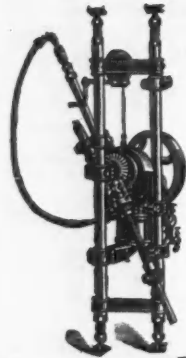
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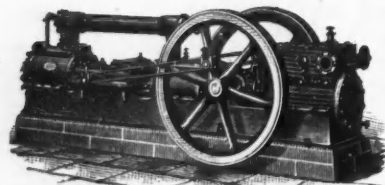
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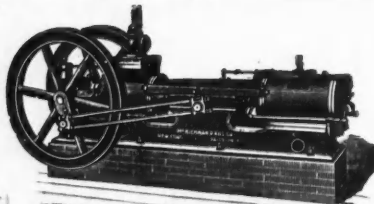
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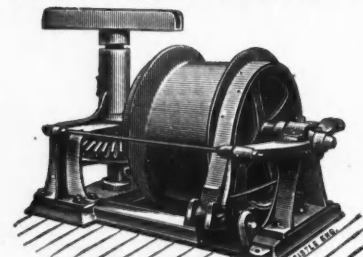
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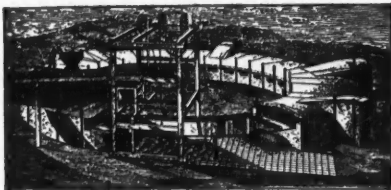
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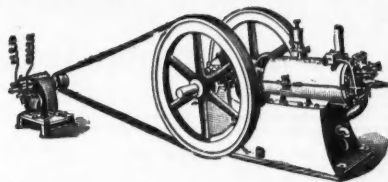
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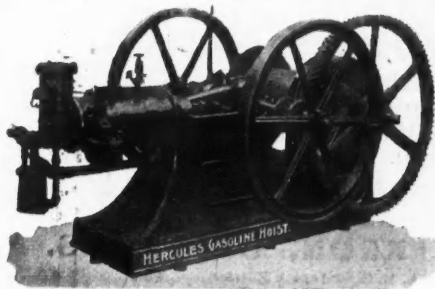
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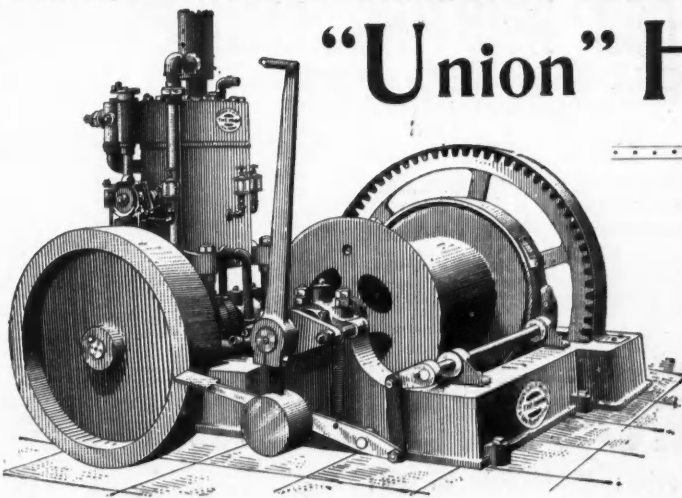


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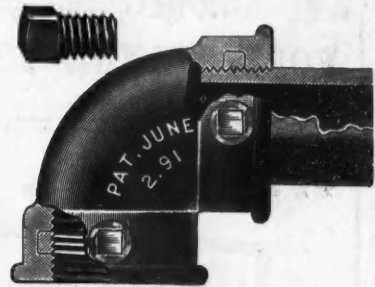
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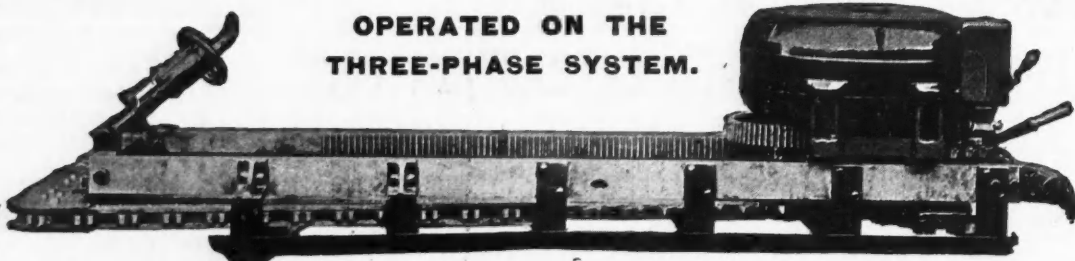
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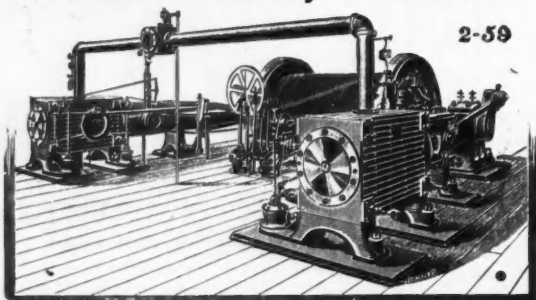
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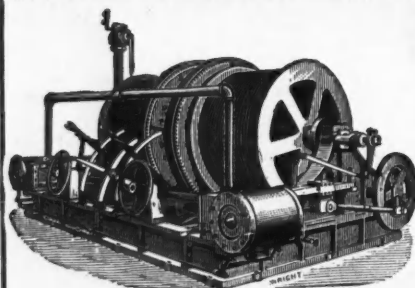
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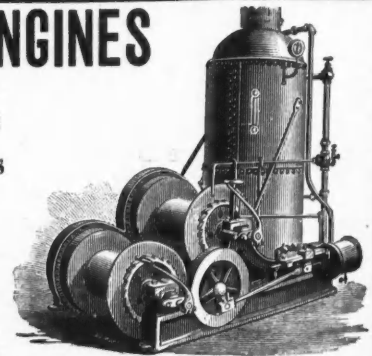
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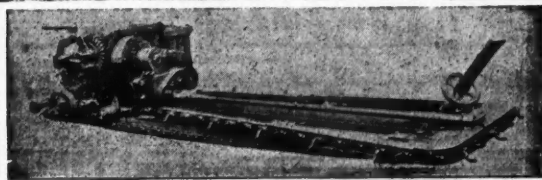
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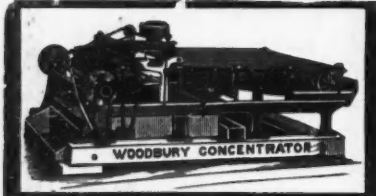
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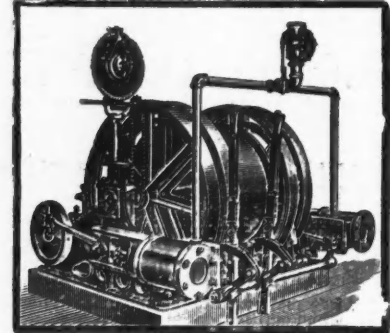
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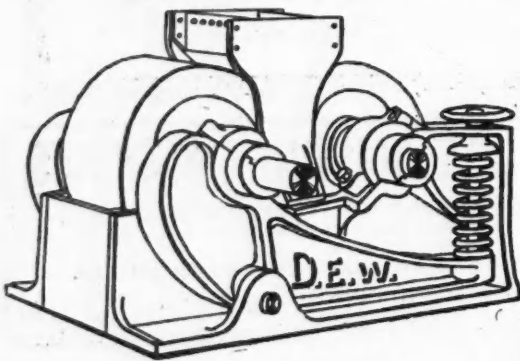
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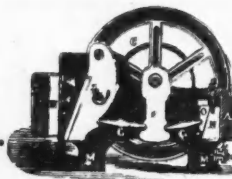
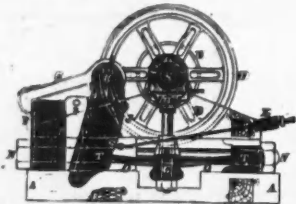
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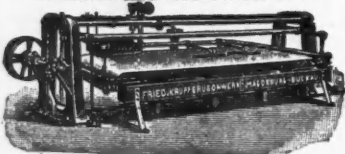
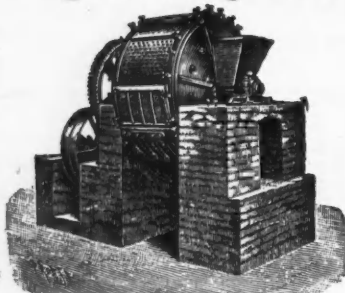
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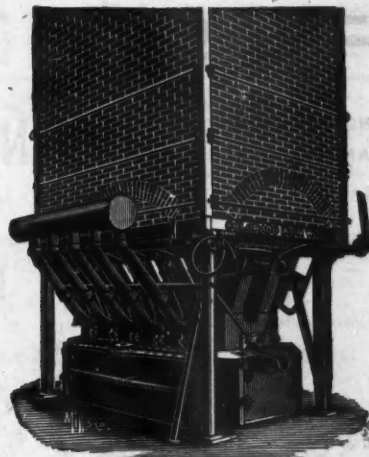
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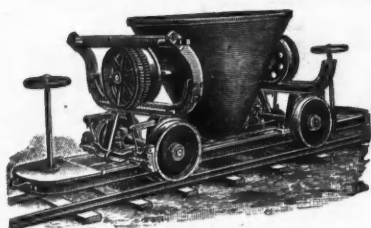
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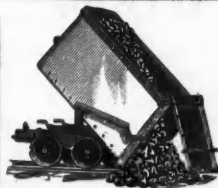
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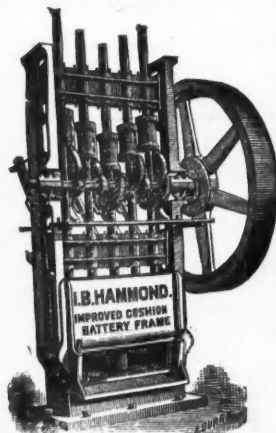
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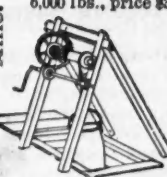
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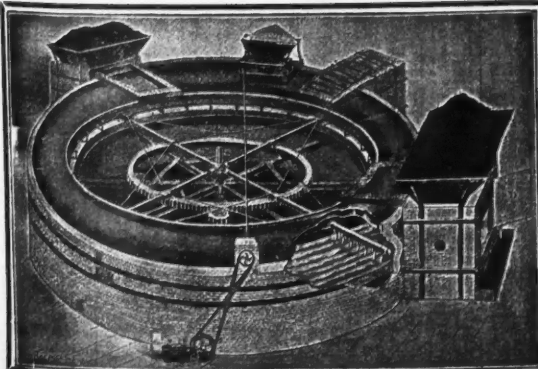


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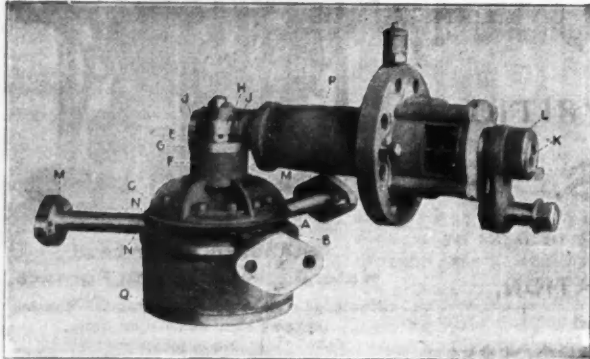
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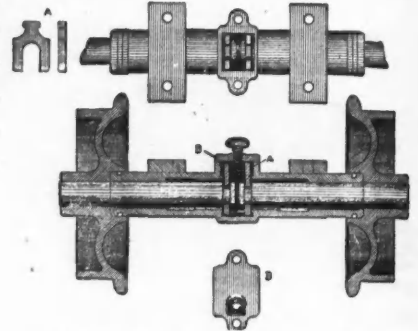
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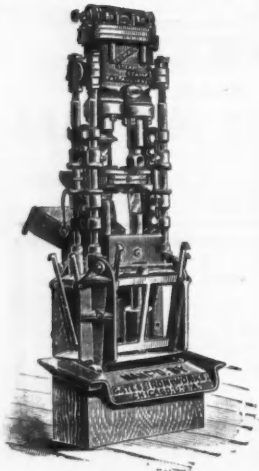
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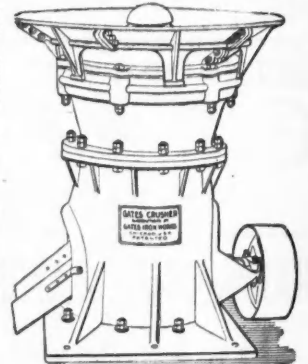
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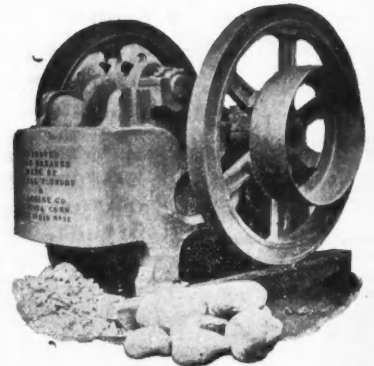
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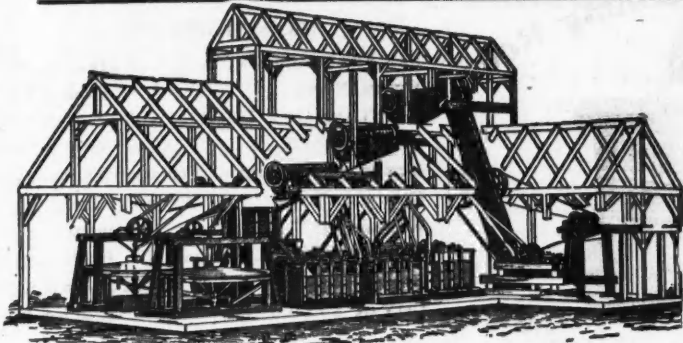


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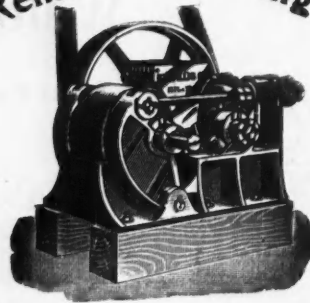
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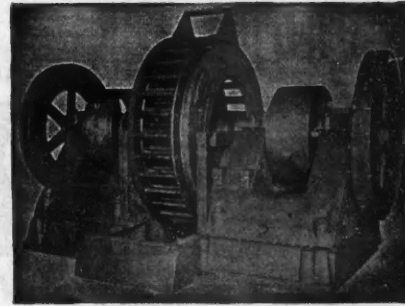
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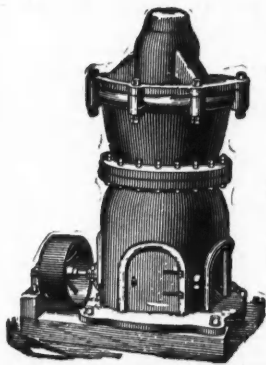
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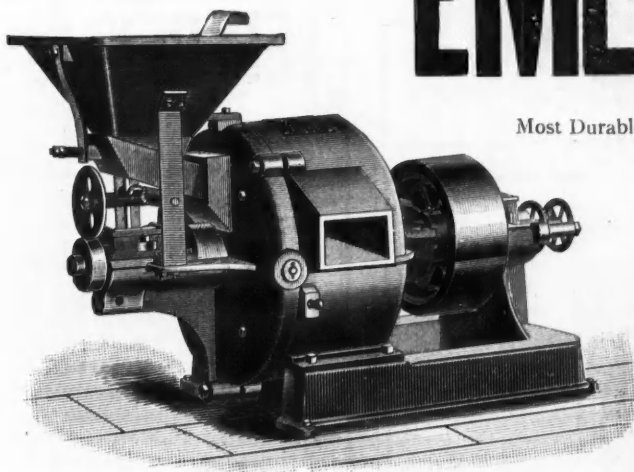
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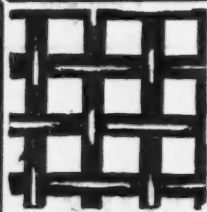
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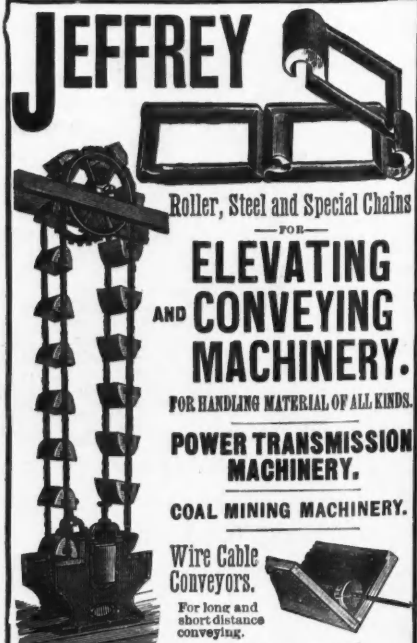
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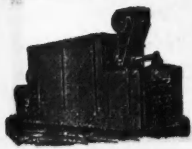
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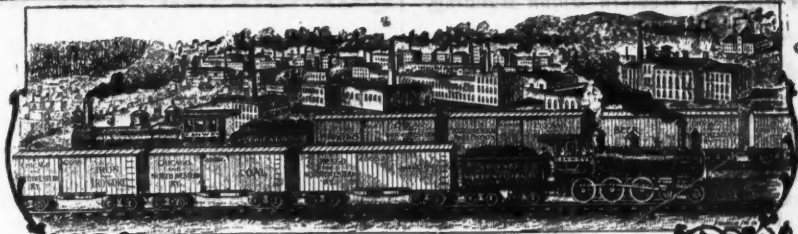
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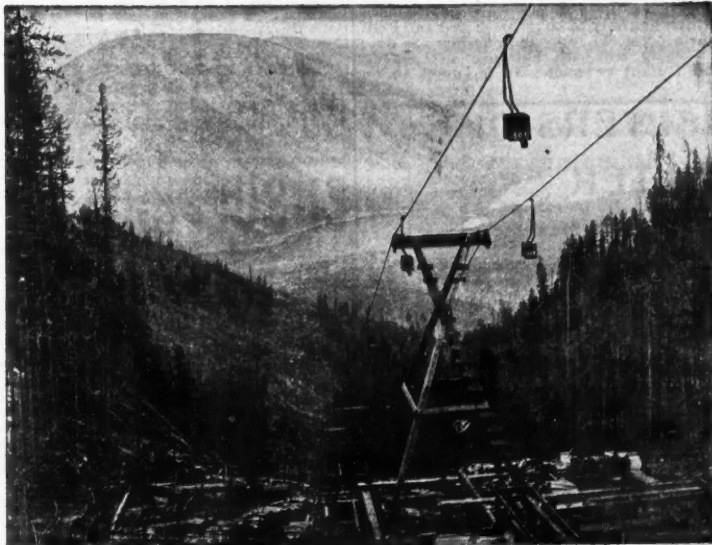
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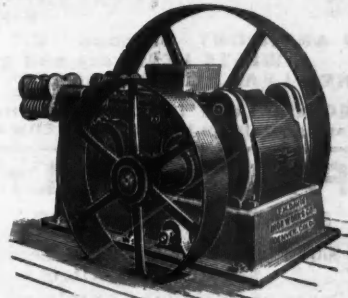


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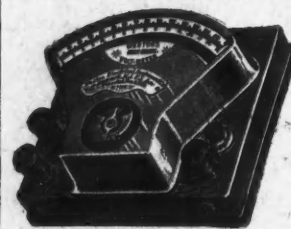
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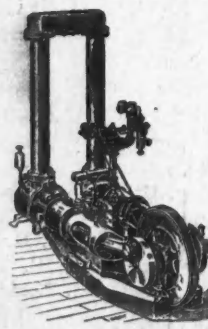
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