THE ENGINEERING AND MINING JOURNAL AND COAL

(Published Every Saturday at 253 Broadway, New York.)
Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXIII. APRIL 10. No. 15.

RICHARD P. ROTHWELL, C. E. M. E., Editor.
ROSSITER W. RAYMOND, PH. D., M. E., Special Contributor.
SOPHIA BRAEUNLICH, Business Manager.
THE SCIENTIFIC PUBLISHING CO. Publishers.

Subscriptions are PAYABLE IN ADVANCE. For the United States, Mexico and Canada, $5 per annum; all other countries in the Postal Union, $7.
The address slip on the paper will show date of expiration of subscription. When change of address is desired both old and new address should be sent.
NOTICE OF DISCONTINUANCE.—The JOURNAL is not discontinued at expiration of subscription but is sent until an explicit order is received by us, and all arrearages are paid as required by law. The courts hold a subscriber responsible until the paper is paid for in full and ordered discontinued. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.
New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.)
London Cable Address—"WELLBOTH." " " " " "

Branch Offices: Chicago, Ill., Monadnock Building, Room 737.
Denver, Colo., Boston Building, Room 206.
San Francisco, Cal., 207 Montgomery Street.
London, Eng., E. Walker, Man'g., 20 Bucklersbury, Room 366.

CONTENTS.

The outcome of the investigation of the Leadville strike is a bill now pending in the Colorado legislature which provides for the establishment of a State Board of Arbitration for the settlement of labor disputes. The work of this board is to be supplemented on occasion by local boards of arbitrators, should the parties in dispute prefer that method. The authority of the State Board is necessarily limited, since the State cannot compel the parties in dispute to submit their differences to arbitration, or indeed to abide by the decision, if they do so. A board of this kind may accomplish a good deal in the way of preventing strikes; but experience in other States has shown that very much depends upon the individual members and the degree of respect which their character inspires. It is hardly probable, for instance, that in such a bitter contest as that at Leadville a strike could have been prevented by any offer of arbitration. In many cases, however, good may be done by such a law; but the results depend largely upon the ability and tact of those who are entrusted with its execution.

The Philadelphia & Reading Company has taken a step backward by changing the form of the monthly statement which it makes public. The new report omits the gross earnings and working expenses of both the Railroad and the Coal and Iron companies and gives merely a statement of the net income and charges, which is entirely unsatisfactory. Moreover, the statement is further complicated by the appearance of a third corporation, the Reading Company, which came in under the complicated provisions of the reorganization. The old statements told the stockholders and bondholders little enough; the new form seems intended to keep them entirely in the dark as to the results obtained from their property. We have here a great and valuable estate whose owners are numerous and widely scattered, but the managers of which seem determined to withhold all information as to what they are doing with the estate. The value consequently can only be guessed at and the property is therefore made altogether speculative. Perhaps this is what the managers intend, but the stockholders and bondholders ought to have something to say about it.

An article in another column of this issue describes a new method of applying heat in the production of power, or rather a new method of saving and utilizing a part of the heat wasted in the present forms of engines. The plans described were worked out by the late Arthur M. Wellington, an engineer of great originality, who devoted several years to the study of thermo-dynamics before he devised what he called a "series engine." Ill health and his untimely death unfortunately prevented him from bringing this engine to completion and from seeing it actually at work; but his notes and calculations were so far completed that it is expected that practical tests will be made. His plans are comparatively simple, and it would not be a very difficult or costly matter to test their merits. Nearly all mechanical engineers recognize the defects of our present system, but their attention has generally been given to the improvement of our present engines and boilers, the devising of better valve-motions and regulators and the economical application of fuel to the production of steam. Mr. Wellington has at least indicated a new line for research which will attract a great deal of attention, and doubtless many engineers and inventors will be ready to follow in the path which he has opened. It is to be hoped that the publication of this article—which is done through the courtesy of *Engineering News*, of which he was an editor—will draw out full discussion.

The copper ore deposits of the Seven Devils District in Western Idaho have attracted some attention from time to time, but very little work has been done upon them so far, principally on account of their situation the difficulty of reaching them and the impossibility at present of carrying heavy machinery into the region. A number of claims have been taken up in the district, but on most of them only enough work has been done to hold. On a few, however, sufficient exploration work has been done to indicate the existence of deposits of copper quite rich enough and extensive enough to warrant further explorations on a larger scale. There is a prospect that the region may be opened up before long. We understand that negotiations are now in progress for the building of a railroad into the district with a strong probability that work will be begun this season. The company, of which ex-Mayor Franklin S. Edson, of New York, is head, proposes to start from the Oregon Short Line at Weiser or Payette, with the intention of continuing the line ultimately northward to Spokane; though the road beyond the Seven Devils is a matter for future consideration. The region has an abundant supply of water; there are several considerable streams and high falls which could readily be utilized for the production of power for the mines. The main consideration is the possibility of obtaining machinery and supplies; and little or no new work can be expected until the railroad question is settled.

Little change has been apparent in the course of pig-iron production during March, and the output shows only a slight increase, being now

at the rate of about 8,500,000 tons a year; with no immediate prospect of a change of any considerable amount. The demand for Bessemer pig has been good, but not sufficient to maintain prices, which have fluctuated to some extent, but are still low. The sales of foundry iron have been only moderate in amount and there has been some sharp competition, as many furnaces have been apparently anxious to sell and have been ready to accept very low prices rather than to hold their iron. The Southern furnaces have had the best of this competition, owing to their generally lower costs, and the Eastern anthracite furnaces have suffered. Some compensation is found by the Western iron makers in lower prices of iron ore and coke. Very few season contracts for ore have been made yet, and outside the large companies, which practically control their own supplies of ore, there is still some uncertainty. Those companies which have business large enough to warrant it seem to be securing interests in Lake Superior mines while they can; and the buying in the open ore market will apparently soon be restricted to the smaller concerns. These will be placed at a still greater disadvantage in this way than they already labor under, and the large companies will be able to disregard their competition entirely, underselling them whenever they see an opportunity to gain by it. Under present conditions there is not much inducement to blow in more furnaces.

At this season of the year many mining districts are realizing very forcibly the disadvantages and costs of poor roads. We hear continually of work delayed and difficulty in obtaining supplies because the roads are impassable. A dirt road badly made in the first place and kept up badly—or not at all—is always an expensive affair to those who are obliged to use it, and is suffered to exist generally because very few people realize how much money a good road would save for them. The movement for better roads has had good effects in many parts of the country and its further extension is very desirable. Of course, there are districts which must suffer on account of their location, which makes road building very costly, or because their traffic is too small to warrant the incurring of much expense; but there are many where a united effort could secure a great improvement in this respect. In many mining districts also road material is plentiful and the cost of making good highways would not be great. The addition of 500 pounds to the average load of a team may not seem very important by itself, but it may make a very considerable difference in expenses in the course of a year. We have in mind a case where the outlay of $5,000 on a road by the owners of a quarry was repaid to them in less than two years by the saving in expenses; and a member of the firm —who was at first opposed to the expenditure—said afterwards that no one payment by the firm brought in a more direct or better return than the $500 or $600 a year it cost to keep the road in good condition. Not every mining district can have a railroad; but nearly every one can have a decent road if it goes to work with a will.

Longwall Working in the Anthracite Coal Mines.

In the report for 1896 which Mr. G. M. Williams, inspector of the Fourth Anthracite District of Pennsylvania, recently completed, he embodied a number of suggestions as to the methods of mining the coal. He says that "the method or system by which the largest quantity of coal can be extracted from a given area of land, with the greatest degree of safety to the employees and at the least cost, is the desideratum in every coalfield." After referring to the two main systems of mining, longwall and breast-and-pillar, of which all other methods are but modifications, and describing the method used in the anthracite coalfield, he makes this suggestion: "Where there is nothing on the surface to cause damage to the workings by letting water or sand in, and where there are no valuable buildings to be damaged, I think a better plan of working anthracite and many bituminous mines would be to work the breasts forward without incurring extra expense, and have the pillars from 30 feet up proportional to the depth beneath the surface, and as soon as a series of from eight to ten breasts can be driven to their terminus, pillars should be worked all out from the face backward, all together, and the props all taken out so as to allow the top to fall in behind."

The practicability of working the Pennsylvania anthracite coal seams on the longwall plan has been discussed by prominent mining men for quite a number of years, and not a few have, like Mr. Williams, advocated the adoption of the system under certain favorable conditions. The fact that by this method of mining practically the entire contents of the seam are removed from the mine would on its face appear a very tempting argument in its favor, but so far no operator has yielded to the temptation to work his mine on this system. The point upon which the decision to try the method has hinged has been the positive presence of the necessary favorable conditions to make the method a success. The presence of surface improvements and of surface water are conditions that exclude the adoption of the method at many of the mines in Mr. Williams' own district. Where there are no bodies of standing water or of running water on the surface, the percolation from rain and snow is so great, even when the surface remains unbroken, that the expense of the removal of the water is a very large item. There are anthracite mines where to-day five tons of water and more are pumped out to every ton of coal mined.

The removal of the coal and the pillars in such a way as to throw the greatest pressure of the overlying strata upon the area where it is desired to break down the roof would be found no simple problem. Quite often the anthracite seams have an extremely hard sandstone roof that permits a breast to be driven double width (60 feet) without the use of a single prop. Such a roof would not be desirable for longwall working. On the other hand, the soft slate roofs are at times so shattery that it is with difficulty that the breasts can be driven to their full length 10 feet wide, and then a skip be taken off each rib retreating. Breast-and-pillar scarcely suffices under this condition, much less longwall. From these two extremes of roof we approach the most favorable one through various kinds more or less advantageous, each, according to its failure to break as desired, adding to the expense of the system.

One condition, however, is sure to make the adoption of the longwall system inevitable in the future, and that is depth. Mr. Williams very properly states that below 1,500 ft. pillars cannot be left of sufficient size to withstand the immense pressure upon them, and the only thing to do is to take out all the coal and allow the roof to cave in. Until that depth is reached, and a change from the present system becomes imperative, it is not probable that the longwall method will be adopted in the Pennsylvania anthracite mines.

The Outlook for the Transvaal Mines.

Reports from the Transvaal continue gloomy, although there is, apparently, a small increase in production at present, owing to a fair supply of water, and the labor conditions, which are at least no worse than for some time past. While the accounts are perhaps somewhat overdrawn, for effect upon the government, to induce it to grant the desired reforms, there can be no doubt that the mining industry there is passing through a critical period. The reaction from the period of inflation which reached its height in 1895 is now in full progress, and the mines are feeling it in every way. With many of them not merely their prosperity but actually their continued existence depends upon careful and economical working. To a certain extent the necessary retrenchment depends upon the reforms which the government is asked to grant, such as lower taxes and railroad rates, the better organization of native labor and the abolition of monopolies; but to a great extent also it depends upon better methods and management underground and closer working. It is not easy to drop extravagant methods of working, and to go carefully into every detail of expenditure, though it is necessary if the cost of exploitation is to be reduced as it ought to be. Moreover, many of the mines are burdened with unduly expensive plants put in when the boom was at its height, when money was easily obtained and expenses were gauged rather by the possibilities of the future than by the necessities of the present. These things are realized now, and they constitute a considerable share of the difficulties of the situation.

We believe that in due time the gold mining industry of the Transvaal will be placed on a better and more solid basis, but it will require hard work and careful management, and it will also involve a good deal of reorganization and consolidation, with much individual loss, before it is accomplished. Even then the profits of the industry will not be great, and only moderate returns can be expected in even the best of the mines.

It is inevitable that during the process of reorganizing the mining industry many of the purely speculative companies must go under, with heavy losses to those who invested in them. The management of some of these companies has been very bad, and now that facts are beginning to be known, it seems really extraordinary that any one could have been induced to invest in the shares. But we all know how much is possible during a boom.

Two years ago it looked as if the Transvaal would soon take the lead among the great gold producers and predictions of double the present output were not considered extravagant. While this wonderful field will certainly continue to contribute a large amount, and indeed a very important proportion of the world's supply of gold, it is equally certain that a great majority of the Witwatersrand mines are too poor to pay and will cease to be worked when the European shareholders stop the supply of money, that indispensable motive power.

Out of a length of about 40 miles of gold-bearing reefs in the Rand district, it is probable that the mines on fully 30 miles, and perhaps on even more than this, are too low-grade to pay, not only at the present comparatively high costs of working, but even at those more economical figures which are sure to be attained within a few years.

The output of the profitable mines will continue for years to increase, but the output of those that do not pay will fall off, and of course the

ridiculous estimates of the future output of the mines which have been published by interested parties will not be realized. As the new deep-level mines begin to produce they will not do much more than take the place of old mines worked out or ceasing to be profitable. With regard to the deep levels also, we must consider the great amount of capital required to start them, and it is doubtful whether many of them will make any adequate return unless a greater improvement in the value of the ore is shown than there is any reason to expect.

The Transvaal mines have had their period of inflation, and they are now going through the sobering process, which is always an unpleasant, prolonged and disheartening one.

NEW PUBLICATIONS.

DESIERTO I CORDILLERAS DE ATACAMA. Por Francisco J. San Roman. Santiago de Chile; National Printing Office. Pages, 672.

The geology of the desert of Atacama, which forms the northern part of territory of Chile, was but little known until recently. This exploration of this region and the adjcining mountain range was undertaken in 1883, after it had passed wholly into the possession of Chile. The examination of the country was made under the direction of Señor San Roman, and occupied portions of several years. The mineral resources of the country are considerable, and the report gives some interesting details with regard to the region, and the travels and explorations of the engineers through it. Gold, silver, copper and manganese ore are found, and worked to a small extent.

The second part of the volume contains a report on Señor San Roman's mission to the United States as delegate from Chile to the International Geological Congress at Washington in 1891, and on the proceedings of that body.

GAS AND FUEL ANALYSIS FOR ENGINEERS. By Dr. Augustus H. Gill. New York; John Wiley & Sons. Pages, 90; illustrated. Price, $1.25.

This is a convenient manual intended for the use of engineers who are concerned in the designing and management of boiler and power plants. It is a condensation and rearrangement of a course of lectures delivered to students in the Massachusetts Institute of Technology, and is unlike some other books of the kind in that it is not merely a "professor's book," but a practical and useful assistant to the engineer. The chapters treat of Sampling and Apparatus; Analysis of Chimney Gases; Measurement of Temperature; Calculations; Reagents and the Laboratory; Derivation and Composition of Fuels; Analysis of Fuels. An appendix contains a number of useful reference tables. The chapter on Analysis of Chimney Gases deserves especial attention, as it is in this way that the engineer can often detect losses and learn in what way economies in fuel can be applied. In general, the methods given are those which can be applied readily and with only a moderate equipment of laboratory apparatus. While the work is, of course, based on past experience, the presentation and arrangement are the author's, and he has succeeded in condensing his information into a small space in a way which engineers will appreciate.

THE GOULBURN WEIR AND ITS DEPENDENT SYSTEM OF WORKS. Compiled from Official Records by Stuart Murray, Chief Engineer of Water Supply of Victoria. Melbourne, Victoria; Public Printers. Pages, 16; with 27 plates.

This elaborately illustrated monograph describes the largest irrigating work yet undertaken in Australia, work on which has recently been completed at a cost of about $2,300,000. The Goulburn River is the largest river in Victoria and is the chief tributary of the Murray, which forms the boundary between that colony and New South Wales. The works include a dam, storage reservoirs and two canals which carry water to the lands to be irrigated. The irrigation system will be extended to about 800,000 acres of land, and in addition water is furnished to several towns and some power is utilized at the dam.

Mr. Murray's account gives a brief history of the work and a full account of its execution. It is accompanied by a number of maps, drawings and photographs which give an excellent idea of the plans and the methods adopted. The weir or dam itself is of masonry, 925 ft. long over all, and provided with six tunnels to permit the escape of water in the flood season. It is an interesting work for engineers, and Mr. Murray has presented an excellent account of it.

REPORT OF THE DEPARTMENT OF MINES OF NOVA SCOTIA FOR THE YEAR ENDING SEPTEMBER 30TH, 1896. By E. Gilpin, Jr., Commissioner of Mines. Halifax, N. S; Queen's Printer. Pages, 76.

The Department of Mines of Nova Scotia deserves credit for its excellent reports, and the completeness with which its statistics are gathered and stated. The Province has a considerable mineral industry; coal, gold, gypsum, grindstones and building stone being the chief commercial products. Gold is found in considerable quantities and the output of not far from 25,000 oz. annually varies little from year to year. Last year it showed an increase. Gold mining is carried on steadily, generally in a small way, there being no large mines.

The iron industry is capable of considerable expansion. Besides the mines worked there are several which were last year idle, and other deposits exist which can be drawn upon when the demand requires it. A large bed of magnetite of good quality was located in Cape Breton during the year, which is well situated for mining and exporting at a moderate cost.

The coal industry is an old one, the records showing that 1,668 tons were mined as long ago as 1785; and yearly statements of production have been made from that date up to the present time, 112 years. Nowhere else in America can such statistics be found. The production grew gradually, but very slowly up to 1850, when 180,084 tons were reported. By 1860 the output had grown to 322,593 tons; in 1870 to 568,270 tons; in 1880 to 954,659 tons; in 1890 to 1,786,111 tons; and in 1896 it was 2,047,133 tons. At present the growth is limited by the demand and by the competition which Nova Scotia has to meet in Canada with American coal. With a sufficient market the output could be considerably increased in a year or two. The mines are reported generally in good condition.

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.

Electric Power Transmission. By Dr. Louis Bell. New York; the W. J. Johnston Company. Pages, 502; illustrated. Price, $2.50.

The Coal Mines Regulation Acts, 1887-1896. By B. Francis-Williams and G. Pitt-Lewis. London, E. C., England; Butterworth & Co. Pages, 195.

The Workshop Manual and Compendium of Useful Information. Compiled by John J. Davies. Chicago; *The American Artisan Press.* Pages, 250; illustrated.

Stones for Building and Decoration. Second Edition. By George P. Merrill. New York; John Wiley & Sons, and London; Chapman & Hall. Pages, 506; illustrated. Price, $5.

Annual Report of the City Engineer of the City of Minneapolis, for the Year ending December 31st, 1896. F. W. Cappelen, city engineer. Minneapolis, Minn.; State Printers. Pages, 104; with maps and illustrations.

The Law Relating to Maximum Rates and Charges on Railways. By A. Kaye Butterworth, Arthur Reginald Butterworth and F. H. Cripps-Day. London, E. C., England; Butterworth & Company. 1897. Pages, 246.

The Materials of Construction: A Treatise for Engineers on the Strength of Engineering Materials. By J. B. Johnson. New York; John Wiley & Sons. and London; Chapman & Hall. Pages, 788; illustrated. Price, $6.

Map of the Black Hills of South Dakota and Wyoming, with full descriptions of Mineral Resources, etc. By Samuel Scott. Custer City, S. Dak.; Published for the author, 1897. Text, 40 pages. Map, scale, five miles to one inch. Price, $1.25.

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.

Butte & Boston—and Others.

Sir: A publication issued by Lawson, Weidenfeld & Company for the purpose of inducing speculators (preferred) and investors to buy Butte & Boston, Boston & Montana, etc., is just out, containing a lot of rubbish-so-called statements, but neither proofs nor arguments of any value. Are these not the same brokers who advised the public by circular 18 months ago to sell Boston & Montana shares when they were quoted at about $70 or $80, and, notwithstanding their predictions, the stock went up to $128?

Their present circular is probably issued to help unload the holdings of the Butte & Boston syndicate, amounting to about 100,000 shares. A good scheme, but rather thin. X. X.

NEW YORK, April 8, 1896.

Strontianite.

Sir: I would ask you to give me some information regarding the value of strontianite, or carbonate of strontium. We have a large deposit of this material and cannot find out from any source what it is likely to be worth. I cannot find from any of the government reports that there is any produced in the United States, but the price lists of wholesale druggists give the nitrate at 6c. per pound and the carbonate 28c. I suppose it means the refined article. By putting me in communication with some one that would be likely to use this material you will greatly oblige

GRANT'S PASS, Ore., March 22, 1897. A. C. TAYLOR.

[There is no commercial production of strontianite in the United States because there is no market for it in this country. The mineral is found in several localities, and could be furnished in considerable quantities. We are informed that some is used in England and in Germany; but the price is low, the English makers obtaining all they need at about $2.50 to $3 per ton ex ship, Liverpool. The German quotation is a little higher, say $4.25 per ton ex ship at Antwerp. It is used chiefly in making red fire for fireworks.—ED. E. & M. J.]

Electric Conductivity of Cast Copper.

Sir: I have been interested in your remarks on Mr. Brown's "M. B." copper, and desire to endorse Mr. Channing's opinion regarding the same, that anyone can make as good copper as the M. B. brand if he will cast directly from the refinery furnace, with such care as is ordinarily taken in the casting of wirebars. Some time since I had my attention called to the popular impression that cast copper was of low conductivity, and immediately made a series of experiments to prove or disprove this alleged fact. The tests were made on bars ½ in. square in section, which were cut to that size on a planer from our regular wirebars, and, after testing, these same samples were drawn into wire and the conductivity of the wire tested. The results showed that the conductivity of the cast copper was from 95 to 98% of that of the same copper rolled and drawn into wire and annealed, or practically of the same conductivity as hard-drawn copper wire would be, made from the same copper. The misapprehension of the conductivity of cast copper undoubtedly comes from the fact that copper castings are not made usually at the refinery furnaces, but at foundries where the proper smelting of copper is not thoroughly understood. In many cases the copper is melted in crucibles which may have been used previously for brass or bronze castings, there-

by introducing, besides the oxide of copper, impurities much more deleterious in their effects. We have in use at Buffalo a cast copper conductor line, similar to that mentioned by Mr. Channing as in use at Great Falls. The bars are each 2 × 2½ in. in section, lapped and bolted together and carry a current of 1,000 amperes at about 15 volts. The conductivity is 98% of that of rolled annealed copper. It is my belief that if some of the cast copper whose conductivity is said to be 30% was rolled and drawn into wire that its conductivity would be found only slightly improved, and that the same proportional difference would be found to exist as in the case I have investigated; that is, the conductivity of the impure casting would be 95 to 98% of the same copper rolled and drawn. It is somewhat amusing to see a composition containing 99·15% of copper taken for purposes of comparison of conductivity. Such copper is unfit and would never be used for the manufacture of wire bars, where there are any conductivity requirements. Pure C. & H. Lake copper averages 99·88% copper and electrolytic slightly higher, the remainder being composed mainly of oxide, with some slight traces of iron and other impurities. Any decrease in this percentage of copper indicates an increase in the amount of impurities, not necessarily copper oxide; and the decrease in electrical conductivity with a very slight increase of impurities is extreme.

A. SYDNEY WARREN.

BUFFALO, N. Y., March 29, 1897.

German and American Mining Schools.

Sir: One reading the discussions upon this subject might infer that the institutions located at Freiberg and Boston are the only schools of that character, and that no American schools are practical. There are others, and according to their circumstances they endeavor to do the best that they can. The Michigan Mining School is in the midst of a mining atmosphere, where the students are in daily contact with mining men, mines, shops and smelting works. The whole spirit of the people is in sympathy and touch with the student's work. Here he becomes familiar with some of the deepest and best-conducted mines and the largest mining machinery the world has ever known. During the winter months weekly excursions are made down into the mines and time is spent in the study of the surface plants and smelting works. The students have in the spring practical work underground in the mines in mining surveying and mining. Beside the laboratory work in such subjects as chemistry, assaying, mineralogy, physics, petrography, drawing, etc., the students have extended practical work during the summer term, spending the entire time either in the shops, in plane and railroad surveying, in field geology, in the stamp mill or ore-dressing works, or in testing of materials, etc.

It is believed that the instruction at the Michigan Mining School is not only more practical than at Freiberg, but that it has for American students the greater advantage of dealing with American practice. By no means the least attraction to students in mining engineering is the fact that this institution alone, of all in the United States, devotes itself entirely to the problems relating to the mineral industries, which makes those students the central figures, while in most other American schools they form a very subordinate quantity in the organization, and must put up with what the dominant courses are willing to grant them. Further, the Michigan Mining School continues in session 45 weeks a year, and all day for six days a week, so that the student can readily obtain in it in three years that for which in most schools he has to work for four years. Freiberg is almost 132 years old, while the Michigan institution is not yet 11 years of age, but it now has 124 students in mining engineering to the 200 at Freiberg at our latest accounts. The record of the work done by the 87 graduates of the Michigan school, as shown in its catalogue, it is thought will demonstrate to any one the results of its practical education. Other American schools are, in their way, doing excellent work, and they deserve full credit; and it is not believed at the present day a student in mining engineering has any need to go abroad to study unless it be for some specialty after he has graduated in this country.

M. E. WADSWORTH,
President Michigan Mining School.

HOUGHTON, Mich., March 29, 1897.

The Water-Jacket for Blast Furnaces.

Sir: Mr. Herbert Lang, in his articles in the *Engineering and Mining Journal* upon "Furnace Construction and Management," seems to question the value of the water-jacket in modern smelting operations. The water-jacket is very seldom discussed among practical men, I have always supposed, because its value was accepted as a matter of course. The lead furnaces now in use in the western portion of the United States and Mexico are all conventional as to form, dimensions, and general construction. They differ only in detail. In fact it is the survival of the fittest. No one says that the evolution is complete, and no doubt there will be improvements from time to time. Considered as a piece of chemical apparatus the water-jacket lead furnace seems admirably adapted to all purposes for which it is intended. Any one of the following advantages seems to me a sufficient reason for its general use:

1. Absolute prevention of corrosion of the walls by any kind of slag. Consequently its internal contour never changes. Lead blast furnace slags are very nearly universal solvents for rock-forming material. Under favorable conditions they will absorb large quantities of either acids or bases without losing very much in fluidity. Considering their chemical properties, one would not expect to find a material to resist their corrosive action better than firebrick.

2. Economy in construction and repair. This may not be true in every case, but in many places where freight rates are prohibitory, this constitutes one of the chief advantages. A wrought-iron jacket will last for years and can be repaired by any good machinist.

3. Easy access to the interior of the furnace. Anyone who has cut out the crucible of a furnace having a brick breast and one having a tapping-jacket, will appreciate the difference. No doubt, in smelting under ideal conditions, with no necessity of ever opening the furuace, this would be no advantage. But such conditions do not exist. Let me give Mr. Lang the conditions under which I am working at present and ask him what he would do without water-jackets under the circumstances: Freight, $35 to the nearest railroad; no firebrick or good clay; the ore containing from 17% to 20% Zn and 2% or 3% of As and Sb and so low-grade that it is necessary to smelt with charcoal alone (oak and pine, which Mr. Hofman says are unsuitable) and produce a slag containing from 9% to 12% of ZnO. A furnace constructed of iron pipes and firebrick would not do at all here, first, because there is no brick, and second, because the campaign of a furnace is only about nine days. With water-jackets we blow out a furnace, clean out the shaft and crucible, and have it in blast in two hours. How long would it take to do the same with the water-pipe furnace? Could such a furnace be built in removable sections? From what I have seen of pipe-coil tuyeres at iron blast furnaces I judge that a pipe is quite as easily punctured as the hollow wall tuyeres.

Another question I would like to ask Mr. Lang: If there is such a waste of heat from the water-jacket, why is it that at the present time smelting is done with a lower fuel charge than ever before? Mr. Lang speaks of constructing furnaces with any material at hand. No doubt such things can be done. The Mexicans in this part of the country do successful lead smelting in a plant, which complete—blowing apparatus and all—does not cost over $50 or $100, and do their cupeling in a hole scooped in the ground. They also crush sugar-cane in a one-mule mill as simple as a farm grindstone plant; but although it is successful, the large haciendas are putting in machinery at a cost of $60,000 to $100,000. Nor have I heard of the adobe stack being introduced into any large smelter. They still insist upon putting up modern water jacket furnaces at great cost.

Efficiency first, and economy will generally follow as a natural consequence. Simplicity is a great desideratum in any piece of apparatus, but at the expense of efficiency it is sure to be false economy.

A. VAN ZWALMVENBURG.

MEXICO, March 6, 1897.

Electric Transmission in Russia.—A plan is under ventilation for transmitting by electricity the power of the Wallinkoski Water fall, in Finland, by means of overground wires, to St. Petersburg. Applications have been made to the Finnish authorities for the necessary concessions.

A Chemical Bubble Factory.—The New York *Times*—on the authority of an Oil City contemporary—says that a soap bubble factory is in operation near Franklin, Pa., a little town on the Erie Railroad near Oil City. It is at a point where pipes, carrying gas and oil, run under a sluggish brook. There is considerable alkali in the mud on which the water rests. This alkali unites with oil that leaks from one of the pipes, forming "saponule," an imperfect soap. Gas escaping from the other pipe, rises through the strong solution of this substance, and the result is that a constant succession of bubbles form on the surface of the water and float away through the air. They are of all sizes from an inch to more than a foot in diameter, and, being very numerous and all coated with iridescent films of oil, they present a most beautiful spectacle when illumined by the bright sunshine. Some break and disappear at a height of 20 ft., but many of them soar above the tree tops and out of sight, resembling, more than anything else, gorgeous toy balloons. They are much more brilliant than ordinary soap bubbles, the gas adds speed to their upward flight, and so strong are they, it is said, that leaves and twigs floating on the water are often carried away by the larger spheres.

Treating Slimes on the Witwatersrand.—Several of the Witwatersrand companies are making arrangements to treat the slimes which have heretofore been rejected, as well as the tailings. At the Crown Reef mine, says the Johannesburg *Star* in a recently received issue, two additional iron tanks at the slime works are complete. These tanks have concrete bottoms with a fall toward the center, and as the concrete work is just finished, it wants a few days to dry and harden thoroughly. These two additions bring the number of treatment tanks up to eight, each 31 ft. × 10 ft., and this plant will allow of sufficient time being given to each charge to obtain thorough dissolving of the gold contents.

At the present time a profit of $3,840 monthly is being made from slime on a 64% extraction, and the extraction is expected to be brought up to 75% with the additional time which can now be given to each charge. A higher extraction means, of course, increased profit. For November and December the assay value of the slimes filled into the tanks was 0·24 oz., and the cost of treatment was 97c. per ton, and the royalty 7·5c., bringing the total cost to $1.04½. This cost, worked out on the tonnage milled, is equal to 18c. per ton, while the gold recovered on the same basis was equal to 44c., so that the larger proportion recovered was profit. Arrangements have been in hand for some time at this mine for the addition of a sorting table at the head gear. It is expected that about 15% of waste will be rejected with a substantial increase in grade and recovery.

A Copper-Sheathed Railroad Car.—A passenger coach, finished with copper on the outside, instead of the usual paint and varnish, is in service on the New York, New Haven & Hartford Railroad. The advantage claimed is that the cars are more readily kept in condition of cleanliness and brightness, and when it is necessary to send a car to the shops for an exterior overhauling it is ready for the service again in half the time required to paint and varnish it. All the wood-paneling and sheathing is made in precisely the same manner as at present, except a shade thinner, and a light coating of copper is formed around the wood, fitting closely into all curves and corners. Each piece of sheathing and its strip of copper are passed through the machine simultaneously and come out ready for use with the copper wrapped tightly around the wood. After the sheathing and other members are covered or plated with copper they are applied to the body of the car in such a manner that the exposed surfaces are not punctured by nails or other fastenings. All joints are watertight. Only one car has thus far been finished in this way, and the copper on this car was oxidized, giving it a dark, glossy finish. The next car will be put on the road without this, as the copper will oxidize in the atmosphere. No paint or varnish is used on the outside of the car, excepting on the roof, platform, hoods and window sash. The numbers and letters are made of cast aluminum and are attached by screws. The weight of the car is not increased by this method of finishing; in fact, in the car just put into service the weight was lessened.

THE WELLINGTON SERIES ENGINE.

The late A. M. Wellington, an engineer of great originality and force, spent several years prior to his death in 1895, in the study of thermodynamics and the development of a new form of engine. Since his death patents covering his inventions have been secured, and some preparations made to put the engine into practical use. We are enabled, through the courtesy of *Engineering News* (of which he was formerly one of the editors) to present a description of Mr. Wellington's remarkable invention.

The Wellington series engine is an apparatus designed to convert heat into power with a greater efficiency than is obtained in the best existing forms of steam engine. For example, the very best existing steam engines convert into mechanical work some 10% to 12% of the total heat generated by the fuel burned in the boiler furnace. A thermo-dynamic analysis of the Wellington engine shows that it should effect this conversion with much greater efficiency; and if made commercially successful should convert into power from 25% to 40% of the total amount of heat generated by the fuel which it consumes. In general it may be described as an arrangement of several ordinary steam engines in a series with their respective boilers and condensers arranged in such a manner that the wastes of one engine are utilized in the next. In other words, the heat discharged from one boiler is utilized in the next one of the series, and first cited, but is directly utilized, and lessens by just so much the fuel consumption in the heater. Finally, to avoid inequality of operation, a uniform "heat interval" is adopted for each boiler and for each condenser. By the term "heat interval" is meant the number of degrees difference of temperature between the water in any boiler or condenser and the circulating fluid which is imparting heat to the water in the boiler, or absorbing heat from it in the condenser.

To make the idea still plainer, let us suppose that the circulating fluid leaves the heater at a temperature of 500° Fahr., and leaves boiler *E* on its way to the cooler at a temperature of 220° Fahr. Then its temperature will be decreased 56° in passing through each boiler. Suppose that in the cooler its temperature is reduced to 50° Fahr. Next in the condenser *E* it will receive as much heat as was imparted to boiler *E* less the amount converted into work by engine *E* and the loss of heat by external radiation from the boiler and engine *E*. Suppose this total to be 15%. Then the gain of temperature in each condenser as the fluid passes along will be 85% of 56° or 47·6° in each condenser. These various temperatures are marked upon the diagram, Fig. 2. Suppose also that the pressure of the steam in each boiler is that due to a temperature 10° less than that of the circulating fluid leaving that boiler, and that a similar difference of temperature exists in each condenser between the temperature of its contents and the temperature of the circulating fluid leaving it. Then the temperature in boiler *A* will be 434° and in condenser *A* 278°. Then the

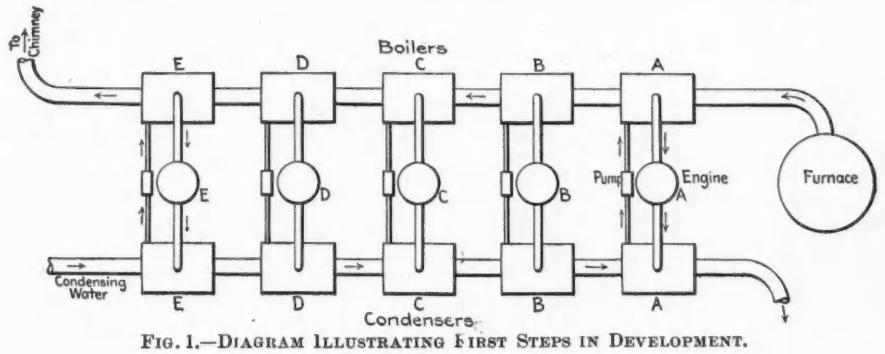


FIG. 1.—DIAGRAM ILLUSTRATING FIRST STEPS IN DEVELOPMENT.

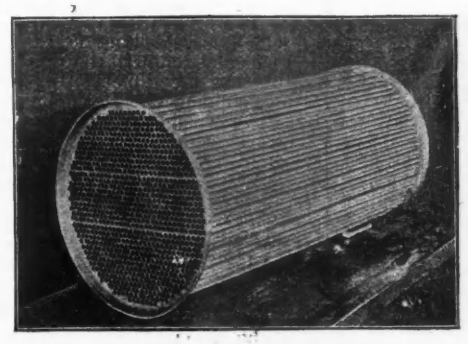


FIG. 3.—MULTITUBULAR BOILER.

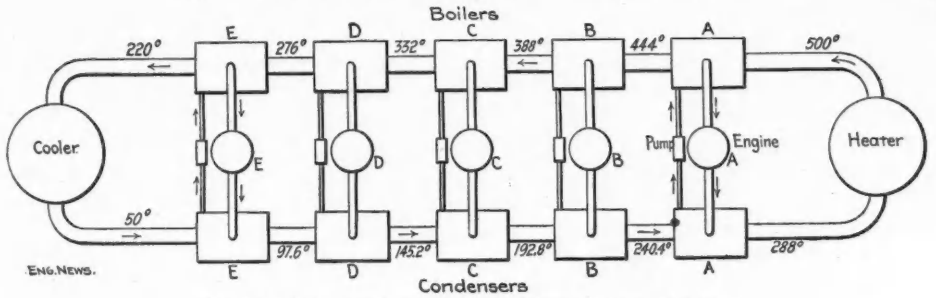


FIG. 2.—DIAGRAM ILLUSTRATING OPERATION OF ENGINE.

THE WELLINGTON SERIES ENGINE.

the heat accumulated by passing the cooling fluid through the several condensers in series is also utilized to economize the fuel consumption.

The general principle of operation of the engine is illustrated in the diagram plan, Fig. 1. Here *A*, *B*, *C*, *D*, *E* are a row of ordinary steam engines, each supplied with steam from a boiler on one side of it and exhausting into a surface-condenser on the other side. The liquid which accumulates in the surface-condenser is pumped back into the boiler by a pump attached to the engine. The boiler, engine and condenser, marked *B*, are exact duplicates of those marked *A*, and the same is true of *C*, *D* and *E*. Evidently if a furnace were attached to each boiler and a suitable supply of cooling water were piped to each condenser, we would have five complete working steam power plants, each independent of the other. But now suppose that instead of burning fuel under each boiler we place a single furnace at the right-hand end of the row, and pass the hot gases from it first through the tubes of boiler *A*, then through boilers *B*, *C*, *D* and *E*. Also suppose that we connect the several condensers so that the cooling water flows first through condenser *E*, then through *D*, and so on till it finally leaves condenser *A*. It is evident that each separate set, consisting of boiler, engine and condenser, will still be operative, and that we may expect a greater total output of power from a given consumption of fuel and condensing water than before, for by the successive passes the heat will be pretty thoroughly extracted from the furnace gases by the boilers, and the condensing water will be heated up to about the point at which it is no longer efficient by the time it leaves the last condenser. Of course, with the arrangement above described boilers *A* and *B* would make a surplus of steam, while boilers *D* and *E* would make very little. On the other hand, the condenser *E* would be very efficient; condenser *D* would be somewhat less efficient, and so on until condenser *A* would probably have difficulty in maintaining a proper vacuum.

In the Wellington engine, as illustrated by Fig. 2, we have a "circulating fluid" which takes the place of the hot gases from the furnace and the cold condensing water in the mechanism just described. This circulating fluid may be either a liquid or a gas, which fills all of the piping in the entire circuit from the heater at the left-hand end, through the tubes of the several boilers from *A* to *E*, then through the tubes of the cooler, then through the tubes of the several condensers from *E* to *A*, and finally into the heater again. The liquid is caused to circulate by any suitable form of pump. It will be seen at once that by the use of a continuous circulating fluid, all the heat which is accumulated as the fluid passes through the several condensers is not lost as in the example absolute pressure of steam in boiler *A* will be 355 lbs. and there will be a back pressure in condenser *A* of 48 lbs. In a similar way we find that boiler *B* will work at a pressure of 192 lbs. and a back pressure of 21 lbs. will exist in condenser *B*. In boiler *E* a pressure of 14 lbs. absolute will exist and the condenser *E* will have a vacuum of 28 in.

It will be evident that under these conditions, with water and its vapor used as the working substance in each engine, as assumed, the engines toward the right will do a much larger amount of work than those toward the left. But now suppose that instead of using water as the working substance in each engine, we use it for one or two engines only, say for engines *A* and *B*, and for the engines *C*, *D* and *E* we adopt a working substance which will evaporate at a lower temperature, so as to give approximately the same amount of work with the same drop in temperature that occurs in boilers *A* and *B*. We may mention, for example, ammonia and carbon-dioxide. Other liquids more volatile than water which have been suggested as working substances, and some of which have been used in experimental engines or refrigerating machinery, are alcohol, ether, chloroform, carbon bisulphide, carbon tetrachloride, and acetone (C_3 H O). Mr. Wellington also proposed and experimented with the distillates of petroleum as working substitutes.

On the other hand, it is not essential that different working substances be used in the different engines; on the contrary, the advantages of simplicity due to the use of steam alone as the working substance may cause that to be adopted except in cases where so large an amount of power is to be generated as to make the greater economy due to the use of different working substances an important object. It will be seen, for example, that with a series of five engines, as shown in Fig. 1, we could use water as the working substance in all, and by varying the amounts of heating surface in the different boilers and condensers, we could secure the same output of work from each one of the five engines. More in detail, we would give boiler *A* a small heating surface, boiler *B* a greater amount, and so on till boiler *E* would have the most of all. On the other side of the circuit, condenser *E* would have the least surface and condenser *A* the most.

It will be readily seen that the formula for the efficiency of the engine can be stated as follows: Efficiency = (Heat supplied in heater — heat lost in cooler and by radiation) ÷ heat supplied in heater. It will be seen that the numerator of the above fraction represents the heat that is converted into work.

As to the details of construction and operation of the Wellington series engine, if we take up first the engines proper, it is evident that these may

be any ordinary single-cylinder engines with a cut-off adjusted to give maximum economy. The mechanical arrangement of the engines and the grouping or arrangement of the different sets in a series will of course depend upon the particular work for which the engine is designed. It will probably be found advantageous to make the several engines exact duplicates of each other, both for economy in manufacture and convenience of repair. It will be also advisable to so mount the several engines that any one engine can be disconnected from the rest for adjustment or repair. The pump by which the liquid which accumulates in the condenser is forced back in the boiler may also be any simple form of force pump, requiring only to be so set that the liquid from the condenser will flow to it by gravity.

Turning now to the boilers and condensers to be used with this new form of engine, it is apparent at once that an entirely different structure from the ordinary boiler is required, and upon the successful design of such a structure the practical success of the invention as a whole is doubtless dependent. If a series engine were to be built with boilers of the ordinary externally fired type, their bulk and the loss of heat by radiation would alone be sufficient to make the apparatus impracticable and inefficient as a heat engine.

Mr. Wellington, in his study of this feature of his invention, became convinced that it was possible to construct boilers for his engine which should have an enormous power in a small space. Practically the entire experimental work which was done upon the invention was in this field, and that it was in some degree successful will be evident from the fact that a 2-H. P. steam engine was actually operated at full load by steam from a boiler with a bulk of less than 0.1 cu. ft.

The boilers with which Mr. Wellington experimented were of two classes. In his first work he followed the design of the ordinary multitubular boiler, except that the dimensions adopted transcended anything ever tried with steam boilers. He adopted as a standard copper tubes only ¼ in. in diameter and spaced them as closely together in the tube sheets as was mechanically possible. The first boiler built was only 9 in. long and 5 in. in diameter, giving a volume of only 0·1 cu. ft. Yet in an actual test it developed 1½ H. P. when evaporating a petroleum distillate with a boiling point of 80° Fahr. and heated by a stream of water at 212° Fahr. Of the second boiler of this type a photograph is shown herewith in Fig. 3, the tubes and tube plates being removed from the boiler shell. It will be seen that the flange of the tube sheet at the left is conical, while that on the right is cylindrical. To assemble the boiler, the parts shown in the photograph are forced into the shell (a piece of brass or copper tubing). The end plates are then put on and conical collars bear against the flanges of the tube plates, forming a steam-tight joint. The boiler shown is 10 in. in diameter and 21 in. long, having a volume of 0·903 cu. ft. and weighing complete 47·25 lbs. It has 903 tubes ¼ in. in diameter. The heating surface is 103·3 sq. ft., and weight of water contained is 20·8 lbs.

Very soon after this larger boiler was built, however, Mr. Wellington hit upon an entirely new plan of boiler construction by which he hoped to go even further in the direction above noted in the reduction of weight and bulk for a given power, and at the same time to make a boiler which would be constructed at a far less cost than the tubular boiler. It consisted of a series of copper plates about 15 in. in diameter, which are covered with peculiar corrugations or channels. These were joined together in pairs, the edges of each pair being brazed so that the two plates facing each other formed a closed chamber. A number of these pairs are placed in a tubular case and are so connected to pipes at the top and bottom that fluid can circulate through them. Pipes are also connected to the case in which these sections are placed, so that the circulating fluid which heats the working substance will pass through the narrow channels which are left between each pair of plates. In this manner an enormous amount of heating surface is obtained in a very small space. In fact, this type of boiler is far superior even to the tubular boiler shown in Fig. 3 in this respect. So promising did this invention appear as a means of solving the problem of the transfer of heat in small space with a small temperature interval, that a great part of the work done in the development of Mr. Wellington's invention was devoted to the design and perfection of this plate boiler. A boiler was actually built made up of 26 sections with plates 16 in. in diameter and containing 208 sq. ft. of heating surface.

United States patents Nos. 549,981, 549,982 and 549,983, issued November 19th, 1895, cover the invention, and various modifications in detail. These patent specifications form really an elaborate treatise on the series engine, including an extended discussion of its theory.

ABSTRACTS OF OFFICIAL REPORTS.

Maryland Coal Company, Maryland.

The report of this company for the year ending December 31st, 1896, shows receipts from coal mined and coal on hand, $890,197; interest, $2,177, making a total of $892,374. Payments for mining and other expenses were $764,024; taxes, $9,364; improvements, $18,790; interest, $4,690; a total of $796,868, leaving a surplus of $95,506. From this dividends amounting to $65,944, or 3½% on the stock, were paid, leaving a balance of $29,562. The coal mined was 359,624 tons, against 449,234 tons in 1895, and 351,374 tons in 1894. The company's mines are in the Cumberland region.

Delaware, Lackawanna & Western Railroad Company.

This company issues only a brief statement in which all its earnings from railroad and coal properties are lumped together, no distinction being made either in receipts or expenses. By this statement the total earnings for the year ending December 31st, 1896, were $44,206,352 and the expenses $37,475,373, leaving net earnings amounting to $6,730,979. Interest and rentals paid were $5,406,239, leaving a surplus of $1,324,740, which was equal to 5·05% on the stock. The dividends actually paid were 7%, or $1,834,000, leaving a deficit of $509,260 for the year. Coal mined is not reported; coal carried was 7,484,071 tons, against 7,987,720 tons in 1895. The value of coal on hand unsold increased $557,684 during the year, an important item.

New Central Coal Company, Maryland.

This company's report for the year ending December 31st, 1896, shows that the receipts on coal account were $399,640, and the value of coal on hand $11,362, a total of $411,002. Expenses of all kinds were $387,984, leaving a balance of $23,018 as net earnings. Balance to credit of profit and loss account December 31st, 1895, $63,958; amount charged to mine improvement account, $5,072, leaving $158,886; add net earnings for the year 1896, $23,018; balance to credit of profit and loss December 31st, 1896, $181,103.

The coal mined in 1893 was 223,503 tons; in 1894, 151,002 tons; in 1895, 201,726 tons; in 1896, 188,453 tons. The mines are in the Cumberland region.

Lehigh & Wilkes-Barre Coal Company, Pennsylvania.

For several years this company, which is owned by the Central Railroad Company of New Jersey, has issued no reports. Recently some controversy over the company's position has called out a statement covering the year ending December 31st, 1896. The total income of the company is given at $8,385,447. The expenses were $7,779,660, and payments for mine improvements $81,279, a total of $7,860,939, leaving a balance of $524,508. Interest, rentals, etc., amounted to $745,825, and sinking fund of 10c. per ton of coal mined to $227,662, a total of $973,487, showing a deficit of $448,979 for the year. The statement does not give the quantity of coal mined; on the basis of the sinking fund reported it would be 2,276,620 tons. The statement further says:

"During the first six months of the fiscal year, owing to the prevailing low prices for coal, the business resulted in a loss, but for the six months ending December, there was a surplus over fixed charges and provision for the sinking fund.

"Since 1893 there has been paid off $1,374,813 of funded debt and purchase money mortgages, during which period the floating and other indebtedness has increased $1,229,030. Following is a statement of the debt of the company for 1896 compared with 1893:

	1895.	1893.
Funded debt	$15,079,000	$16,326,500
Income bonds	2,353,000	2,353,000
Mortgages	10,000	137,313
Past-due coupons (on consols held by Cent. R. R. of N. J.)	5,472,552	4,188,192
Floating debt	3,400,224	2,954,491
Other indebtedness	3,236,990	2,463,693

"The past-due coupons and other indebtedness are composed largely of items representing an accrual of book charges covering a period of nearly 20 years and covered into a special profit and loss account. During the period from 1893 to 1896 the company has invested for additional property and new breakers, and has made expenditures on account of future business which have been charged to capital account, nearly $1,000,000. Of the funded debt $678,000 bearing 6% interest matures during the current year and $189,000 in 1898. The consolidated mortgage bonds bearing 7% interest all mature in 1900. There are no other bonds outstanding bearing more than 5% interest. The refunding of the indebtedness of the company (now bearing over 5%) at that figure, together with the payment of the sterling bonds outstanding, would result in a saving of nearly $150,000 per annum."

Delaware & Hudson Canal Company.

This company's report for the year ending December 31st, 1896, shows that the output of anthracite coal for the year was 4,223,131 tons. In addition to this the company transported 1,612,490 tons for other parties, making a total of 5,835,621 tons handled. According to the statements given, the cost of mining the coal reported appears to have been $1.29 per ton; the average receipts, $1.84 per ton. The cost of transportation cannot be clearly ascertained from the report. The profit and loss account for the year is as follows:

Sales of coal		$7,216,363
Canal tolls		44,515
Net earnings from railroads operated		1,269,086
Miscellaneous profits		522,069
Increase in coal on hand, estimated value		561,862
Total		$9,613,895
Mining coal	$5,454,062	
Transportation, canal, river and railroad	1,421,424	
Terminal expenses, Rondout and Weehawken	185,234	
Real estate expenses	15,536	
Salaries and general expenses	210,101	
Taxes	212,526	
Interest	351,000	
		7,848,883
Balance, profit for the year		$1,765,012

The surplus was equal to 5·04% on the stock. The dividends paid were 7%, or $2,450,000, showing a deficit of $684,988 for the year. The report says in conclusion: "Stockholders frequently ask about the coal lands of the company, and the possibility of their exhaustion. Careful reports on file in this office show that coal can be profitably mined from our properties for from 60 to 70 years, with an annual output as large as in any previous year.

"The double-tracking of the Albany & Susquehanna Railroad, referred to in the last report, has been completed and paid for, and places the line in admirable condition to take care of all the business that may be offered it, at a reduced cost for handling.

"The business of the New York & Canada Railroad has required expenditures for permanent improvements from year to year since it was first opened. On account of advances made by this company for such purpose, as well as for its construction, that company issued during the past year its debenture bonds for $1,000,000, bearing interest at 4½% per annum, and payable in 1964. These bonds were guaranteed by this company, and sold at par. The profit and loss of the yearly business of the New York & Canada Railroad is, and always has been, placed, as it should be, in the profit and loss account of your company."

Pig Iron Production of Belgium.—The blast furnaces of Belgium turned out in February 83,440 metric tons of pig iron, 6,440 tons being foundry iron, 29,680 tons forge iron and 47,320 tons steel pig. The total showed an increase of 20,930 tons, or 33·5%, over February of last year.

THE NEW BLAST FURNACES AT THE DUQUESNE WORKS.

We have frequently called attention to the tendency in the iron trade to increase the capacity of works and to secure economy of production through the establishment of plants of great size, in which machinery of the latest types can be used. The latest example of this is found in the great blast furnaces at the Duquesne Works of the Carnegie Steel Company, near Pittsburg. Two of these furnaces are already in operation, and two more are approaching completion. At those in blast, the daily output of a single furnace is over 500 tons, and 690 tons has been reached. This far exceeds the capacity of any other furnaces in the world. The Duquesne furnaces have been built with the object of attaining the greatest possible economy in operation, and no attempt was made to save in first cost, the only question being as to the value of appliances in practice. Their working is as nearly automatic as possible, everything being done by machinery, and the manual labor required reduced to a minimum.

In the *Engineering and Mining Journal* for March 27th, page 305, we gave a description of one of these furnaces, with a sectional drawing showing its dimensions and general design. We are now able, through the courtesy of the *Iron Trade Review*, of Cleveland, and the *Iron Age*, to illustrate the general arrangement of the plant and the more important details.

The plant consists of four furnaces, with room for two more. The furnaces form groups of two, each group having eight stoves, a cast-house and boiler plant. Each group of two has its separate blowing engine equipment. There is a pump-house close to the Monongahela River, an electric power and lighting plant, a ladle-drying house and the necessary brick sheds. The Duquesne Steel Works are located near No. 1 furnace, the tracks converging to it. The track system, with storage-room, etc., is indicated in the plan.

Stretching along the whole length of the furnace plant is the stockyard excavated below the general level to a depth of 26 ft., flanked by heavy retaining walls. This stockyard for ore has a length of 1,085 ft. and a width of 300 ft. Its effective width is 226 ft. and its total capacity is 600,000 tons of ore. It is intended to hold in this yard ore enough to last the furnaces during the season of closed navigation, so there will be no stocking of ore at any intermediate point. The yard is spanned by three cranes built by the Brown Hoisting and Conveying Company, of Cleveland, O. Along the whole length of the yard on the furnace side are two series of bins, of which one set is for ore, the other for coke and limestone.

Provision has been made to drain water from the pit and provide against the flooding which might result from a rise of the Monongahela River. At the corner of the stockyard which is nearest No. 1 furnace is a 10-ft. well, connected at a depth of 3 ft. below the stockhouse level by a pipe with the general sewer, which extends along the furnaces between them and the retaining wall. Placed above this well is a centrifugal pump driven by a steam engine, which is used for pumping out the water when necessary. Under ordinary circumstances the water drains naturally into the sewer. When the water rises to within 3 ft. of the stockyard level then a valve in the pipe connecting with the sewer is closed and pumping must be resorted to.

There are 36 ore bins in one line, that farthest from the furnaces. These bins, which are very heavily built, have counterbalanced chutes along each side and are longitudinally divided into two sets. The one is the delivery side; that nearest the furnaces is what is called the consumption side. The angle of rest of the ore being about 35°, the pitch of the bins has been chosen at 45°. The whole line is commanded by two tracks. As the ore is received in drop-bottom cars, it is conveyed along the tracks above the bins. If it is to be stocked, it is dropped into the bins on the stockyard side. From there it is withdrawn into buckets, which are picked up by the conveyor and deposited automatically on the ore pile. There is no track on this side of the bin system. If the ore is not to go to the stock pile, it is allowed to fall from the cars into the series of bins on the consumption side, from which it is directly withdrawn when needed.

When the ore is to be drawn from the stock pile a drag or scoop bucket is suspended from the trolley of the conveyor, and is dragged up the side of the pile until it is filled, the scoop bucket taking about a 5-ton load. In the majority of cases the scoop is emptied into drop-bottom cars placed along the track above the outer line of bins. These cars are then switched to the proper bin on the consumption or inner series of bins. In case, however, that the ore pile in the stockyard is opposite to the bin which is to take the ore, then the scoop is run out on the overhanging extension of the conveyor and dropped direct.

There are three cranes, as noted above, built entirely of iron and steel, each of which has a capacity for handling from 1,500 to 2,000 tons of ore per day of 10 hours. Each crane is independent, and the different motions of bridge travel, hoisting, trolley travel and shoveling are worked

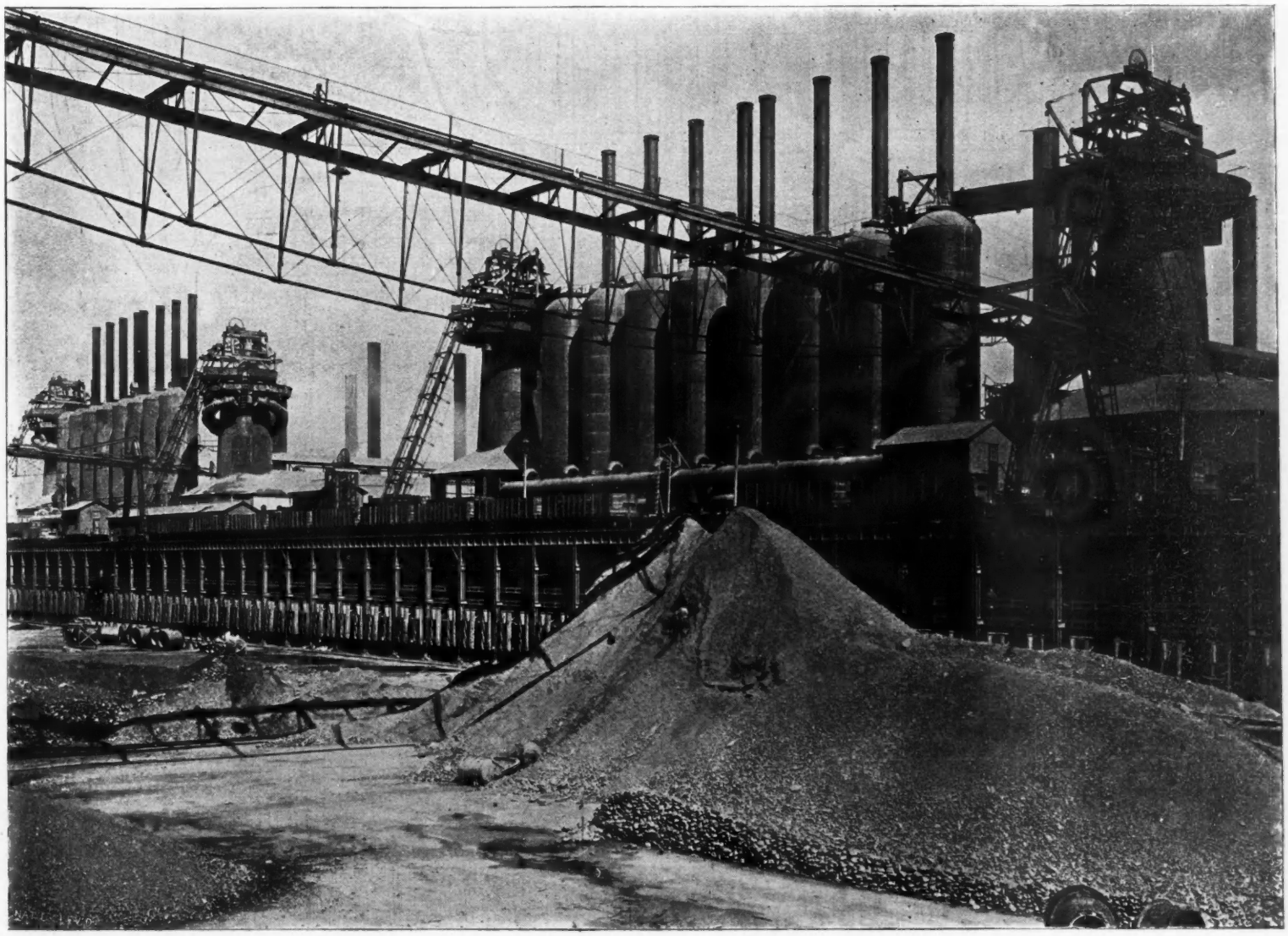


FIG 1.—GENERAL VIEW OF BLAST FURNACES AT THE DUQUESNE WORKS.

by electric power. It only requires the services of one operator for each crane. The cranes have a clear span over the storage yard of 233 ft., and the bridge is supported on one end on a double track pier, and at the other end on a single track pier or shear, at which end the bridge extends beyond the pier 33 ft. over railroad tracks. The piers are of such a height as to bring the bottom chords of the bridge 58 ft. above the floor of the storage yard at the center of the span. The double track pier is mounted on rails 14 ft. 6 in. center to center, straddles over a single railroad track and has sufficient clearance to allow a locomotive to pass under it. On the double track pier is mounted the engine or motor house, which contains the motors and hoisting and racking drums. Above the motor-house is an operator's house, from which position the operator has a clear view of the motions of the crane, which he controls by means of suitable levers connected by gearing with the machinery below. The whole structure is designed to travel along the tracks on which it is mounted at a speed of from 75 to 100 ft. per minute.

The inner series of bins are provided for coke, limestone, mill cinder and some grades of ore. They do not occupy the entire length of the plant, because some of the space is taken by furnace hoisting plant. Since the angle of rest is different, the dip of these bins to the chute side is 30°. One double bin for each furnace is used for limestone, one for mill cinder and one for ore which contains stock drawn upon under special circumstances. All the other bin capacity is used for coke. All these materials are delivered direct into the bins, there being no attempt to carry a stock. The total storage capacity of the bin system, as such, is 9,500 tons of ore, 3,600 tons of coke and 2,200 tons of limestone.

From the bins lying on both sides of the inner tracks the material is drawn by means of counterbalanced chutes into the buckets for feeding the furnace. These buckets rest upon cars, which in the case of ore are provided with weighing scales on the platform on which they rest. Then the correct amount of material is weighed from each bin for the proper burden. A small locomotive then pushes the train of cars with the buckets to the foot of the furnace hoist, where each bucket is, in turn, picked off the car by the hoist carriage and conveyed to the furnace top and the contents dumped. The bucket is then returned to the car to be shoved out of the way for the next bucket to take its place underneath the incline. The charging bucket, as shown in the drawings, is a cylindrical shell of ⅜-in. steel, having an outside diameter of 5 ft. 7 in. It rests upon a bell-shaped bottom, in the apex of which a stem is fixed from which the whole is suspended. The ore buckets are strengthened

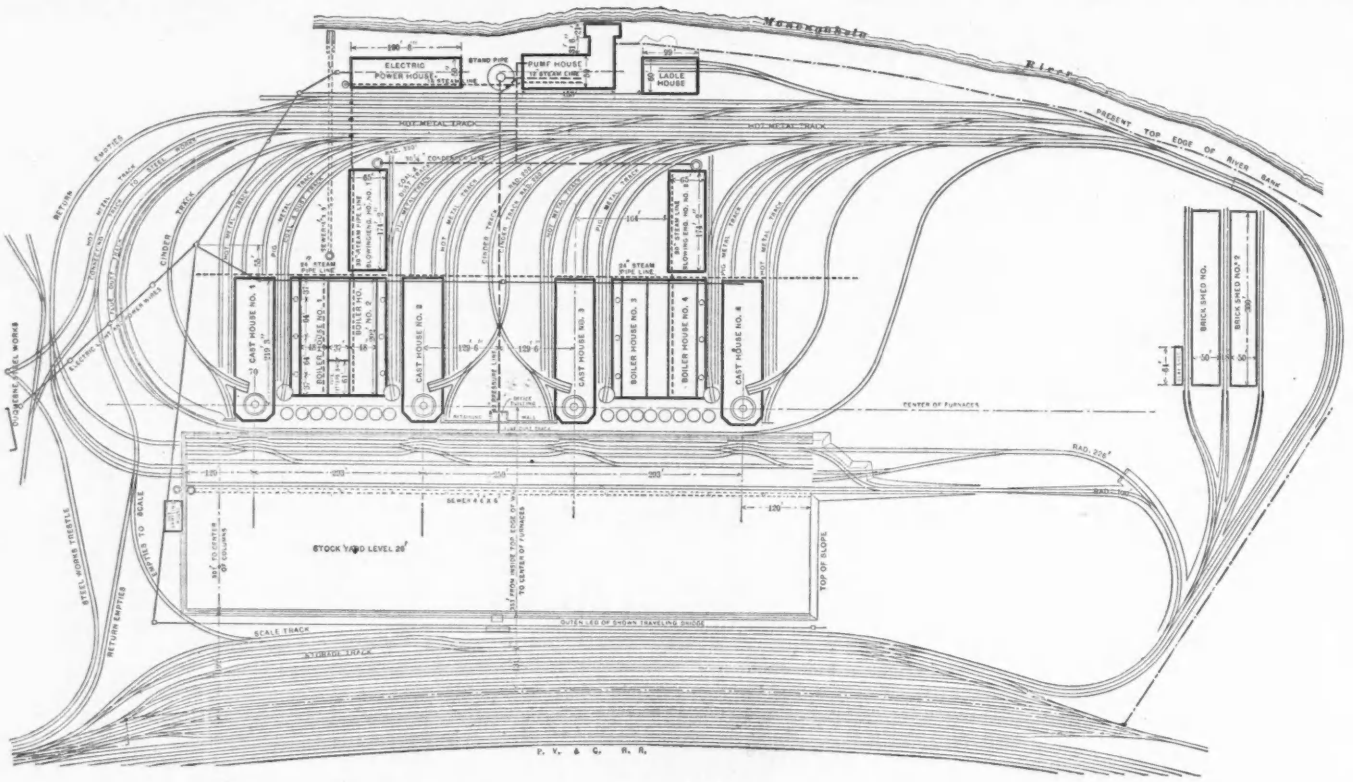
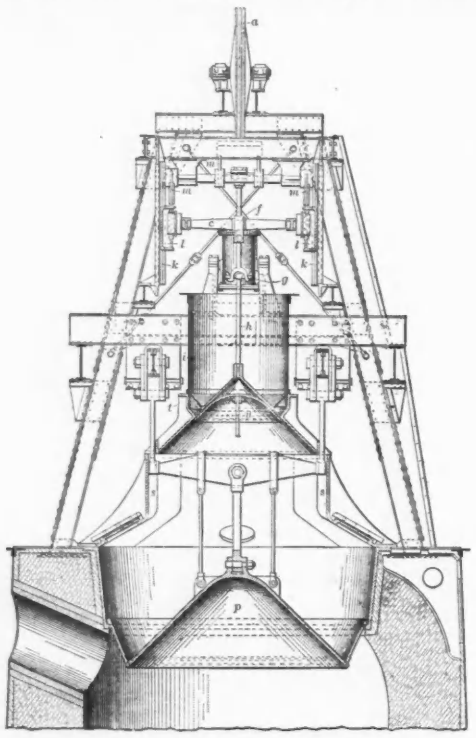


Fig. 2.—General Plan of Furnaces at Duquesne Works.



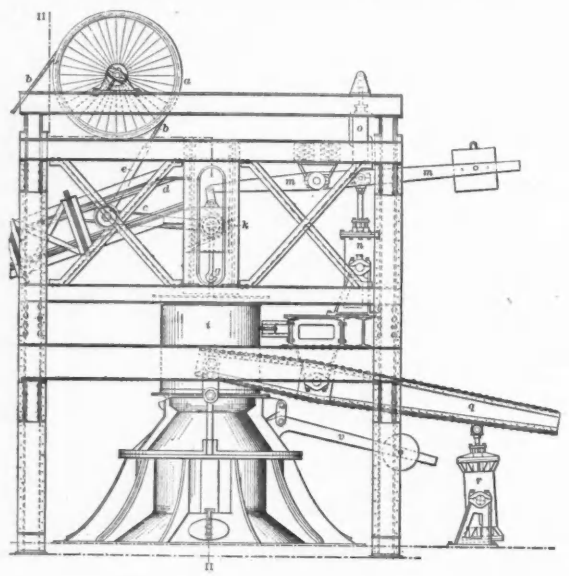


Fig. 4.—Neeland Charging Apparatus, Duquesne Furnaces.

and stiffened by a lining. They carry a load of 10,000 lbs. The coke and limestone buckets have a capacity of 4,000 lbs. of coke.

As shown in the general view, the lower part of the incline is curved. The hoist car when run against the buffer allows the hook to hang free. The incline itself is strongly trussed, the angle being 67°. The hoisting is done by a 14 × 16 Crane vertical engine. The bucket is attached to the bifurcated hook of the hoisting carriage. The hoisting ropes (there being two for safety) are attached to the rear axle. The rear extension of the carriage in rising catches behind the bucket and prevents its swaying during the ascent. When it reaches the top of the furnace the bucket swings free, getting away from the rear axle.

The furnaces receive the ore, flux and coke through the Neeland charging apparatus, the construction of which is shown in the drawings. The cable *b* passes over the sheave *a*. The forward wheels of the bucket carriage *c*, upon the arrival of the latter at the top, enter a section of the track, which is carried in a sliding frame *e*, with channel-shaped side webs. The sliding frame, or shoe, is secured by a link to a lever, *m*, and

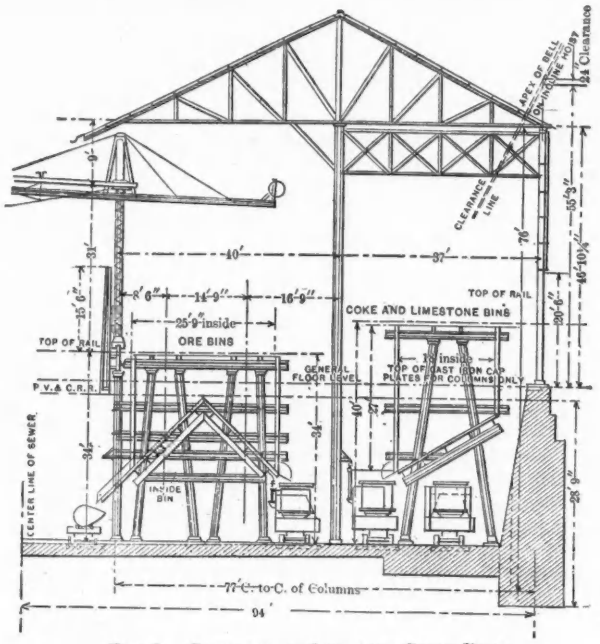


FIG. 3.—SECTION OF ORE AND COKE BINS.

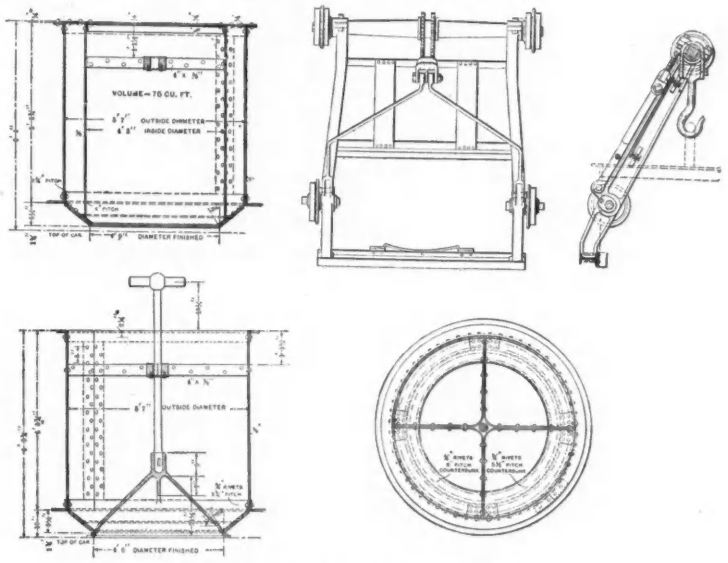


FIG. 5.—ORE AND COKE BUCKETS.

counterweight, actuated by the cylinder *n*. A dash-box cylinder, *o*, regulates the movements of this lever. As the piston rod rises in the cylinder, the shoes and the front axle and wheels of the carriage, together with the ore-bucket, are lowered until the lower flange of the bucket casing rests on the upper hopper. As the shoes continue to lower, the bell-shaped bottom of the bucket moves away from the casing, carrying the gas sealing bell *u* down with it. This allows the contents of the bucket to run out, distributing it uniformly over the main bell *p* of the furnace. The latter is supported by a crosshead, and is operated through the levers *q* by the cylinder *r*.

As the bottom of the bucket returns it picks up the shell, allowing the gas sealing bell to return to place, with the aid of the counterweight *v*. When the sliding frame reaches its highest position and registers with the track rails of the incline the hoisting drum is reversed, allowing the carriage and bucket to return down the incline, landing the bucket on its car. The hook disengages itself, and is in position to pick up the next bucket in its turn. The valves which operate the bucket lever cylinder, as well as the one which operates the main bell, are controlled by the hoisting engineer. The position of the bucket and the main bell during the lowering are made known to the operator by indicators in the hoist engine-house. There is not a single man on the top of the furnace, and the entire charging is under the control of the hoist engineer. The car and bucket are counterbalanced, and since at both ends of the incline the weight needed is less, the counterbalance consists of a lighter and a heavier weight, the former being automatically picked up first. The whole time of picking up and returning a bucket has been cut down to 1¼ minutes.

The furnace stacks have already been described in the article above referred to. Furnaces Nos. 1 and 2, now in blast, have ten 7-in. tuyeres, while Nos. 3 and 4 will be equipped with twenty 5-in. tuyeres—a plan is expected to increase the production, decrease fuel consumption and which lead to a greater regularity of working. The total cubical contents of the Duquesne furnace is 25,000 cu. ft.

The gas is taken off through six flues, and is collected in a bifurcated bustle pipe, each branch being equipped with a 30-in. explosion door. At the end of each half of the bustle pipe is a 30-in. bleeder. The bustle pipe stretches down in a form of a helix, an angle of 45° being maintained in order to aid the discharge of the flue dust, whose angle of rest is 35°. The gas flue is conducted to the lower part of the dust catcher, which has an outside diameter of 28 ft., with a 4½-in. lining, and is 40

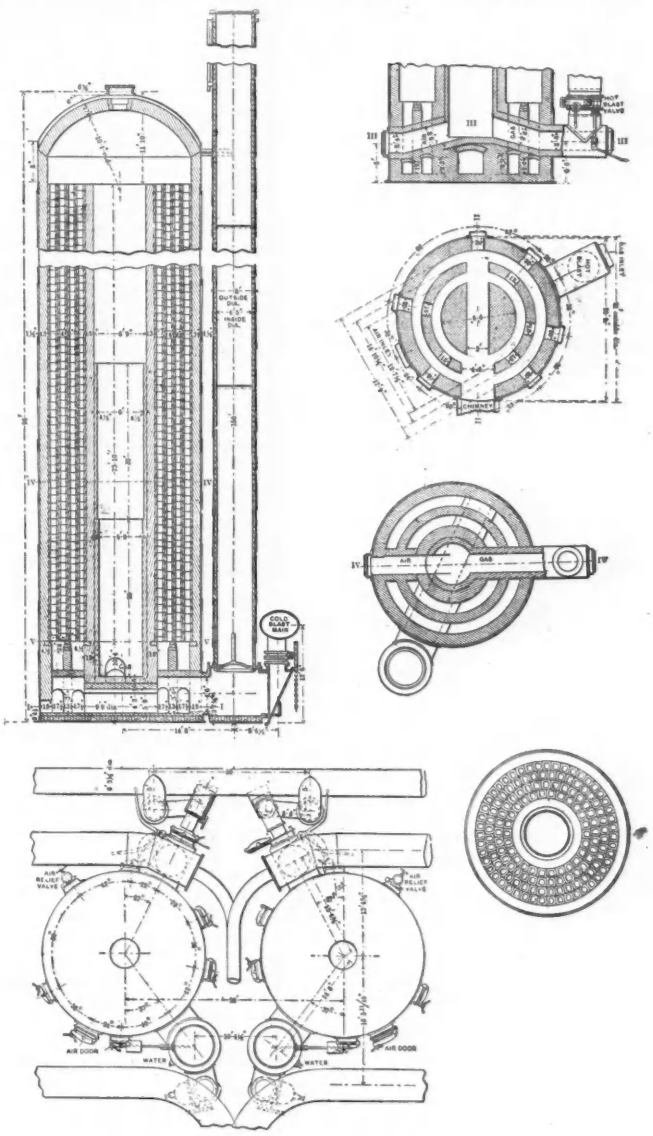


FIG. 6.—COWPER-KENNEDY STOVES.

ft. high. A bleeder stack is arranged on the top of the dust catcher. The function of the latter is to cause a decrease in the velocity of the gas, and thus aid in the depositing of the fine dust it carries. The latter is discharged into cars from the bottom in the usual manner. Underneath each offtake from the gas mains there is a dust pocket. They are all so arranged that the accumulated dust can be delivered by a chute into cars.

Each furnace is equipped with four Kennedy-Cowper stoves 21 ft. in diameter and 97 ft. high over all, bringing the tops of the stoves on a level with the top of the furnace, each pair of furnaces being connected by a bridge extending along the line of eight stoves. The Kennedy stove has a central combustion chamber and checker work of special tiles. The shape of these is clearly shown in the drawings. They have openings approximately 9 in. square with filleted corners for the down passage of the gases through the regenerator. The iron work of the stoves is very strong, to resist the heavy pressure which must be blown at times in connection with such a high furnace. The bottom sheets and first row

of side sheets are $\frac{5}{8}$ in. thick, and the remainder of the shell to the top ring is $\frac{7}{16}$ in. thick. The top ring and the dome are $\frac{1}{4}$ in. thick. The stoves are provided with an independent chimney each 130 ft. high and 5 ft. in diameter. They are provided with a butterfly valve seated on a bronze water-cooled seating-ring.

Each furnace has a cast-house 219 ft. long by 70-ft. span. Along the center of it runs a narrow track suspended from the roof trusses, which, curving around the furnace, extends to a point close to the hoist-house. It is worked by electricity, and has a capacity of 5 tons. It is used as a scrap conveyor to facilitate the return of cast-house scrap to the furnace. On each side, over the balance of the cast-house are two electric overhead traveling cranes of 10 tons' capacity and 32-ft. span. Their tracks may extend beyond the cast-house, so that the cranes be run out of doors when casting is in progress. The cranes are employed in handling the molds for making the pig beds and carry the pigs, which are 26 ft. long, to the end of the cast-house, where a series of driven rollers operated electrically convey the pigs to the breaker. The greater part of the product, say 1,600 tons per day out of 2,200 tons when the whole plant is in operation, will be taken by the adjoining Duquesne Steel Works, so that only a small percentage of the iron made is handled in the cast-house at all, besides the Sunday metal.

The furnace boiler plant, when in operation, is expected to be able to deliver several thousand horse-power of surplus steam to the Duquesne steel plant, and provision for the necessary line is being made.

For each group of two furnaces there are five blowing engines, built by E. P. Allis & Company, commanded by two 25-ton electric traveling cranes, as heretofore described. The engines deliver blast at a pressure of 15 lbs. at the tuyeres. The steam pressure is 120 lbs. The engines, however, can blow up to 25 lbs., and thus have ample reserve. Usually one of the five engines for each group of two furnaces is in reserve for contingencies. Each group of engines has its condensing plant.

The water supply must be drawn from the Monongahela River, which is at all times muddy. At the same time it was desirable to free it not alone from sediment, but also from air. After a careful study the plant has been arranged in the following manner: Two large sluices have been run well out into the river, and are provided with gates at their mouths which can be closed at will. These sluices are made of so large a cross-section in proportion to the size of the suction pipes of the pumps drawing from them that the water flows through the sluices at a very slow speed, thus allowing it to precipitate a good deal of sediment at the bottom of the sluices. Two screens of different size mesh are provided at the mouth behind the sluice gates to catch any floating material. The pumps are placed in a row on a bench or foundation between the sluices, each one having an independent suction well provided with an inlet pipe and valve for each sluice. When it is desired to clean out a sluice all the valves from the suction pipes into the sluice are closed, together with the sluice gates at the mouth. The water is then pumped out and the deposit of mud removed. In the meantime the pumps draw from the other sluices, so that the pumping plant need never be shut down for cleaning purposes.

The pumps are vertical compound condensing, with 22-in. high pressure and 44-in. low pressure, 14-in. pump cylinder and 36-in. stroke. They number four, and are the first of the vertical type built by the Wilson-Snyder Manufacturing Company of Pittsburg. Their total capacity is 20,000,000 gallons per day. The pump-house is commanded by a 10-ton electric crane of 45-ft. span.

The water from the pumps is forced into a stand-pipe. The 42-in. inlet pipe from the pumps rises in the stand-pipe to a height of 40 ft. The 42-in. outlet pipe rises up to 90 ft,, the last 20 ft. being perforated to act as a screen. In this manner a large body of quiet water is provided for below the level of the inlet pipe, so that there is further opportunity for settlement and for getting rid of air. An 18-in. overflow pipe rises within 3 ft. of the top of the stand-pipe, whose diameter is 15 ft., and whose total height is 157 ft. The pump discharge pipe and the pipe conducting the water to the furnaces are connected, forming a Y, with valves fitted to each. A chance is given to drain the stand-pipe.

As any surplus steam can be used in the Duquesne Steel Works, all important engines, such as the blowing engines, river and boiler feed pumps and the electric power engines, have been made compound condensing. The water for condensation flows through the pump-house sluices, and thence through underground pipes to the different engines, each condenser lifting its own water and discharging it into a sewer which returns it to the river.

In the accompanying illustrations, Fig. 1 (from the *Iron Trade Review*) is from a photograph of one group of furnaces; Fig. 2 is a general plan showing the arrangement of tracks, etc.; Fig. 3 is a section of an ore bin; Fig. 4 shows two views of the Neeland charging apparatus; Fig. 5 shows the ore and the coke buckets; Fig. 6 shows vertical and horizontal sections of the stoves.

It has been the common understanding concerning the Duquesne furnaces that their construction was with special reference to the use of a liberal percentage of Mesabi ores. The difficulties attending the employment of these ores in large quantities have been frequently spoken of. The responsibility has been laid upon them of all hanging, slipping and top explosions that may fall to the lot of furnacemen working them. The experience of the management at Duquesne in the past six months has been free from the troubles mentioned, and ore mixtures of which 75% was contributed by that range have been worked without difficulty. Another point that is regarded as established by the work at Duquesne is that Mesabi ores are not disadvantageous in a high furnace.

At furnaces 1 and 2, the air supply has been at an average rate of 38,000 cu. ft. per minute. At furnaces 3 and 4 an average of 50,000 cu. ft. will probably be attained. It has been a feature of the practice at Duquesne, as at Edgar Thomson, to maintain the temperature of air blast at about 1,000°, as compared with 1,200° to 1,300° in average practice at Valley and Pittsburg plants.

At Duquesne there were difficulties, and at the beginning some disappointment as to output, but later operations have been more than compensation in exceeding calculations. The best month's run was 17,182 tons; the best week showed 4,294 tons, or a daily average of 613 tons, and the best day's output was 690 tons. The average coke consumption for the above was 1,700 tons. There has been some variation in the percentage of Mesabi ores used. It is the present purpose to have Furnace No. 3 ready to go in blast about May 1st. Furnace No. 4 will follow a month later. No. 4 will run on basic iron and hot metal will be taken to Homestead. For so much as is run into chills, the Uehling casting apparatus will be installed.

THE SMELTING OF ZINC LEAD SULPHIDES.

Written for the Engineering and Mining Journal by Ludwig Klos.

Some years ago several important experiments were made on the treatment of this difficult material, a number of patents were taken out and success seemed almost probable, so much intelligence and labor were spent. Nothing important, however, seems to have been done in the year lately passed away. A critical review of the methods employed shows that the problem has been attacked by the combination of wet and dry processes, which has its disadvantages, as it involves a large outlay of capital for the erection of a leaching plant, a limited capacity and the loss of the zinc, or at least a costly recovery of it, as the value does not cover expenses at the present prices. The whole operation of leaching is only for the purpose of getting rid of the zinc. The more natural way to accomplish this would be to eliminate the zinc in the slag, and it has been shown that this is entirely possible with our modern practice of lead smelting. There are generally three difficulties feared with a charge high in zinc, a thick and slow running slag; a formation of crusts in the upper part of the furnace and the incomplete separation of slag and matte, thus showing a high assay in lead and silver. Zinc is generally supposed to take the place of lime in the formation of slag and zincy slags therefore show a low percentage of lime. It has been shown that slags can be produced with 12% of zinc without any serious effects to the furnace, provided the zinc sulphides have been carefully roasted. About 7 ft. above the tuyeres, however, crusts form rapidly and the proper passage down of the charges is seriously affected. By employing stronger blast and higher furnaces it has been proved that this difficulty is lessened and even overcome. Good slags of blast furnaces with a high percentage of zinc show without exception low silica and a high percentage of iron. When silica is raised and iron diminished the separation of slag and matte becomes incomplete. A curious phenomenon may be observed in breaking a cone of such a slag. The line of separation is badly marked and pieces of matte adhere tenaciously to the slag. The cracks formed by the concentration of the cooling slag are filled with matte as if the liquid matte were forced into them.

Slags of reverberatory furnaces may be made that show, with a high percentage of silica and comparatively low iron, a still higher amount of zinc, say up to 20% and 25%. The cause may be easily understood if it is remembered that zinc enters the slag as oxide and the separation of slag and matte is more easily accomplished in a reverberatory furnace where the whole mass is in a quiescent state, than in the turbulent flow from a blast furnace.

It is now possible to produce a slag high in zinc from the blast furnace without any serious effect on the proper working of the apparatus, producing, however, a dirty slag, while the reverberatory furnace furnishes the means of cleaning this slag. We have, therefore, in a combination of the blast and reverberatory furnaces the means of converting an undesirable material into a desirable one and our waste stores of zinc-lead-silver sulphides, heretofore a terror to the smelter and thrown away as valueless, can be worked up with no greater expense than common smelting ores. Zinc seems to be lost in this process, but it can be recovered in a most desirable form, if not entirely, at least in large part.

In speaking of a combination of the blast and the reverberatory furnace I mean, of course, not the common reverberatory smelting furnace, but a reverberatory furnace of large dimensions and proper construction in which the liquid slag of the blast furnace is subjected to a settling process. This has been for the first time successfully operated by Mr. Robert D. Rhodes at the Arkansas Valley Smelter in Leadville, Colo. This furnace holds 50 to 100 tons of slag and matte in a liquid state, which is poured into it by an opening in the side wall or in the roof, either directly or by tapping from the furnace or by means of slag pots. This inlet should be situated opposite the fireplace. Two tap holes, an upper and a lower one, situated near the fire-bridge, serve for tapping the slag and matte separately. The fireplace should be constructed in such a manner that a more reducing than oxidizing atmosphere may be maintained in the furnace. With a small fire a very large amount of slag can be kept in a liquid state and hot enough to give every chance for a complete setling. It has been found, indeed, that slags running as high as 6% Pb and 10 oz. Ag have been cleaned down to 1% Pb and 0·5 oz. Ag. The protection of the walls against corrosion seemed at first a serious matter, but this has been easily secured by cooling them with jackets or pipes. With zincy slags this seems hardly necessary; on the contrary it has been found that the cooling had to be dispensed with entirely.

Coal in South Africa.—Both Matabeleland and Mashonaland have magnificent coal resources, says the *South African Mining Journal*. The most westerly basin extends to within 100 miles of the Victoria Falls on the Zambesi, and the carboniferous formation continues almost without intermission to the meridian of Salisbury. The spot nearest to Bulawayo where coal was known to exist was some 150 miles distant (down the Khami River); an ox-wagon service was organized, but was demoralized by the tsetse-fly. Surface specimens of this coal were analyzed by Mr. Van Ness, in Bulawayo, in 1894, and showed a quality not far short of Welsh steam. The natural point of attack for this region is from Gwelo, a northward spur of the tableland (forming the great divide between the Limpopo and Zambesi watersheds), juts forth from that district almost to the Zambesi and terminates in an extensive plateau known as the 'Mfungubusi—the geological formation of which is carboniferous. A tramway route can be constructed here with the utmost facility, for the gradients are most easy, first-class timber is plentiful, and there are no streams to cross; such a tramline would pass through or close to several mineral belts, and would enable coal to be run down to the Selukwe mines—which are some of the most important in Rhodesia.

PERSONAL.

MR. W. E. SHARON has been appointed superintendent of the American Flat Development Company, of Storey County, Nevada.

MR. JULIAN KENNEDY, consulting engineer, of Pittsburg, has started for Russia on business connected with the building of the iron plant at Mariopol, Russia, of which he is chief consulting engineer.

MR. J. S. ELLIOTT has resigned his position as president and as a director of the Playa de Oro Mining Company. The board accepted his resignation, to date from March 16th.

MR. CARL C. JAMIESON, a mining man of the Fort Steele District, in British Columbia, has gone to Alaska, where he expects to go to the far north and remain during the next winter.

MR. JOHN WHYTE, mining engineer, expert for the North American Exploration Company, left Globe, Ariz., recently for Linares, Nuevo Leon, Mex., to make an examination of a copper and gold property.

MR. ALFRED J. MOSES has been appointed professor of Mineralogy in the School of Mines of Columbia University in New York. He is a graduate of the school and has been assistant professor for several years.

MR. T. A. RICKARD, mining engineer and State Geologist of Colorado, is at present engaged in examining some mines in the Lake of the Woods District in Canada. His address until April 20th will be Rat Portage, Ontario.

MR. HERBERT C. HOOVER, of San Francisco, Cal., has been appointed examining engineer by an English syndicate, and will leave for West Australia very soon. Mr. Hoover was formerly connected with the United States Geological Survey.

MR. FRANK L. NASON, geologist and mining engineer, formerly of New Brunswick, N. J., and now of West Haven, Conn., starts for British Columbia in a few days to take charge of the development of a large placer mine in the Big Bend District.

MR. EDWARD J. FOWLER, who has held the position of metallurgist at the Deadwood & Delaware smelter at Deadwood, S. Dak., has accepted an appointment as manager of a foundry in Chicago, and has gone to assume the duties of his new position.

MR. JAMES W. PAUL has been appointed Chief Mine Inspector of the State of West Virginia by Governor Atkinson. He is an engineer who has had much experience in coal mining, and is well acquainted with the West Virginia mines especially.

MESSRS. JOHN J. ABSALOM, of Fayette County; S. A. LEWIS, of Mason County; J. L. PREECE, of Mercer County, and JERRY MEADE, of Ohio County, have been appointed assistant inspectors of mines of West Virginia by the Governor of that State.

MR. G. W. STONE, Leitchfield, has been appointed State Inspector of Mines of Kentucky by Governor Bradley, to succeed MR. C. J. NORWOOD, whose term has expired. Mr. Stone is known chiefly as a lawyer and politician, and has no practical knowledge of the duties of his new office.

MR. ALEXANDER AIKMAN, for 13 years foreman of the Dickson mine of the Delaware & Hudson Canal Company, at Scranton, Pa., has resigned his position on account of failing health. He is succeeded by MR. EDWARD MCGLYNN, the assistant foreman, who in turn is succeeded by MR. SAMUEL OAKLEY.

MR C. J. NORWOOD retires from the position of State Inspector of Mines of Kentucky on the expiration of his term of office. He has held the office for nearly 13 years, and has been a most competent and efficient inspector, being now displaced for political reasons entirely. He was well fitted for the inspector's work by previous experience, having done much practical work in mines and served for several years as assistant on the Missouri geological survey. His retirement will be a serious loss to the miners and mine operators of the State.

MR. HENRY M. HOWE has been chosen professor of metallurgy in the School of Mines of Columbia University. He is too well known to need an introduction here; his work as a practical metallurgist, as an instructor, as author of his monumental work on the *Metallurgy of Steel*, and as a frequent contributor to technical periodicals and the proceedings of societies long since established his reputation. Mr. Howe has been for some time past professor in the Massachusetts Institute of Technology. He will begin his lectures at Columbia about April 20th.

OBITUARY.

FREDERICK HERON, for five years general superintendent of the Phœnix Iron Works, at Phœnixville, Pa., died in Chicago, on April 6th, aged 45 years. He rolled the first steel beams and made the first structural steel in the United States, built the steel plant of the Phœnix Iron Works and was considered one of the best experts on steel material in the United States. He resigned his position with the Phœnix Iron Works about a year ago and went to Chicago, where he was made general manager of the rail mill of the Illinois Steel Works. He was a native of Bradford, Eng., and came to this country in 1880.

WILLIAM EZRA WORTHEN, civil engineer, died in New York on April 2d, aged 78 years. He graduated from Harvard in 1838 and took up the practice of civil engineering. He came to New York in 1849 and was appointed engineer of the New York & New Haven Railroad, of which road he became vice-president in 1854. In the city of New York he was the sanitary engineer of the Metropolitan Board of Health during its continuance, in 1866-9; engineer of the Southern Boulevard, member of the Examining Board of New Docks and Bulkheads, engineer of the first Rapid Transit Commission in the annexed district and member of a later commission. He was a member of the American Society of Civil Engineers, of which he was chosen president in 1887.

GEORGE L. MORRIS, one of the leading developers of the Birmingham, Ala., District, died March 29th, aged 48 years. Mr. Morris went to Alabama in 1870 to assist in the construction of the South & North Railroad, now the Louisville & Nashville, and afterward was one of the builders of the Birmingham Mineral Railroad and of the line from Woodstock to Blocton. He organized the Morris Mining Company and opened up extensive coal mines at Redding, Ala. At the time of his death he was a director in the First National Bank, as well as an extensive stockholder; president of the Morris Real Estate Company, also a director in the Standard Coal Company, the East Lake Land Company, the Birmingham Railway & Electric Company and the Avondale Land Company. He was vice-president of the Empire Mining Company and the Birmingham Gas Company.

ALBERT FINK, who died April 3d, aged 69 years, was in many respects one of the most remarkable railroad managers and engineers of this country. He was born in Lauterbach, Germany, in 1827, and educated in his native city. He came to this country about 1849 and secured employment as an assistant engineer on the Baltimore & Ohio Railroad. After eight years spent on that road and a short connection with the Norfolk & Petersburg, he went to Louisville about 1858 and was appointed chief engineer of the Louisville and Nashville and later superintendent of the road. Between 1861 and 1865 he was obliged practically to rebuild the road several times, as it was alternately destroyed by Federals and Confederates. He remained with the road for about 17 years, becoming general superintendent in 1865 and vice-president in 1870, and under his management it was developed from a local road to a great north-and-south trunk line. Beyond this, however, Mr. Fink devoted himself to the study of transportation questions. The reports which he prepared for the stockholders of the company are models of what a railroad report ought to be, and a special investigation into the cost of transportation resulted in the publication of a monograph on the subject which is a classic in railroad literature, and is still appealed to as the highest authority. He early saw the necessity of combination if the railroads were to live, and to him was due the organization of the Southern Railroad and Steamship Association, the first successful traffic association in this country. When, in 1877, the East and West trunk lines realized the necessity of a similar combination, they chose Mr. Fink as the one man who was able to organize it—and also as the one man whose high character and absolute integrity commanded the confidence of all parties to the agreement. He was appointed trunk line commissioner and held the position for 12 years, carrying the association through many difficulties and holding it together when no other man could have done it, because every member respected and had faith in him; and because to uprightness and justice he added great energy and decision of character and a wide and thorough knowledge of transportation problems. In 1889 he resigned on account of ill health and since then had lived very quietly, for the most part in New York, though he made several trips to Europe. His later years were clouded by sickness, and he was unable to carry out some studies which he had begun. Though his reputation was made chiefly as traffic manager, Mr. Fink was also an engineer of ability; he carried through some admirable work on the Louisville & Nashville, and designed the Fink truss, which is found in many iron bridges, especially in the West and South. Personally he was a man of large frame and striking appearance; and before his health failed there were very few who could get through so great an amount of work in a day. His manner was that of a busy man, quick and abrupt; but he made many warm friends, and his subordinates were usually strongly attached to him.

SOCIETIES AND TECHNICAL SCHOOLS.

AMERICAN CHEMICAL SOCIETY.—At the meeting of the New York Section, on April 9th, papers were read as follows: "On the Manufacture of Dynamite," by G. E. Barton; "Brief Notice of a Modified Method of Fine Silver Assay," by Aug. E. Knorr.

MINING SOCIETY OF NOVA SCOTIA.—At the recent annual meeting in Halifax the following officers were chosen: President, R. G. Leckie; vice-presidents, Graham Fraser, W. Blakemore, Chas. Fergie. Council, H. S. Poole, J. E. Hardman, R. H Brown, George W. Stuart, Charles Archibald, C. E. Willis, F. H. Mason, W. G. Matheson, W. L. Libbey, Geoffrey Morrow, J. T. Burchell, B. F. Pearson.

WESTERN SOCIETY OF ENGINEERS, CHICAGO.—At the meeting on March 24th the Secretary read Mr. Clement F. Street's paper on "Railway Ties in India." At its conclusion Mr. H. G. Hetzler, of the C., B. & Q. R.R., presented his views arrived at from experience and general practice, which were not favorable to metal ties in this country on the score of economy or necessity. Mr. Geo. S. Morrison presented numerous points of interest on the conditions of climate and soil in this and other countries which must be considered in deciding upon the economical and practical uses of materials in road construction. Reference was made by Mr. E. P. Humphrey to the successful and satisfactory use of metal ties on the New York Central at certain points.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—A special meeting was called on March 30th to consider the Dalzeil bill regulating the size of bridge spans over the Ohio, Monongahela, Cumberland, Tennessee and Illinois rivers. The bill provides that no bridge shall be built over the Ohio river with less than a thousand foot span, and none over the Monongahela with less than an eight hundred foot span. Mr. E. K. Morse read a paper on the subject in which he pointed out that in many places on the Ohio River the total free channel at stages favorable to navigation is less than 750 ft. He also pointed out that the total loss through wrecks on bridge piers from the year 1852 up to the present time amounted to only $750,000, while the expense of constructing a single double-track railroad bridge of 1,000-ft. span would amount to at least $2,500,000. The total value of the coal passing down the Ohio River averages less than $5,000,000 per year, by far the greater part of the coal that leaves Pittsburg being carried by the railroads. The point was taken that the future of Pittsburg depends largely upon its railway facilities, and that the Dalzell bill practically prohibits the building of railway bridges across the Ohio and Monongahela rivers, and that it could not fail to be injurious to the welfare of the city. The following resolution was passed by the society:

Resolved: That the president appoint a committee of five to appear before the Congressional Committee of Interstate and Foreign Commerce at Washington, at the proper time, and endeavor either to defeat *in toto* H. R. Bill 9866, or to have it so modified as to be a subject for decision by the War Department and to have each and every case considered on its own merits. The following committee was appointed: E. K. Morse, chairman; Thomas H. Johnson, Gustave Kaufman, Geo. S. Davison, W. T. Manning, Emil Swensson, ex-officio.

INDUSTRIAL NOTES.

The Richmond, Mass., Iron Works, which have been closed for a long time, will be started up at once.

The Dickson, Tenn., Foundry and Machine Shop, recently purchased by Scott Bros., of Birmingham, Ala., has added to its plant a complete brass molding plant.

The Carnegie Steel Company has been given the contract for the first steel building for Japan. It will be erected at Tokio, and contain 1,500 tons of American steel.

The Chesapeake Nail Works, at Harrisburg, Pa., resumed operations in the entire plant on April 5th. The Lochiel Rolling Mills, also at Harrisburg, resumed on the same day.

The Oliver Coke and Furnace Company, of Pittsburg, Pa., has filed notice in the State Department, recently, that it has changed its name to the Oliver & Snyder Steel Company.

The Franconia Iron and Steel Works at Wareham Narrows, Mass., has discharged a number of workmen, and the plant is now being operated under a reduction of 10% in wages.

The Shenango Valley Steel Company, of New Castle, Pa., last week was given a contract to supply 12,000 tons of steel billets. The sale was reported at $15, which would make the order worth $180,000.

Jones & Laughlins, of Pittsburg, Pa., were on April 2d awarded the contract for the new Wayne County Building at Detroit, Mich. The order is a large one for structural material, and is said to be worth over $500,000.

The Greenville, Pa., tube mill went into operation last week. Only a portion of the mill is working, as the machinery is not all placed. In two weeks the plant will be working full force. Another large building is to be erected.

The Bethlehem, Pa., Iron Company this week made a shipment for the United States government to Sandy Hook of 24 cannon. The shipment was made up principally of 8 and 10-inch guns, being finished complete, ready for mounting on their carriages.

The Rochester & Pittsburg Coal and Iron Company will build 200 new coke ovens at Reynoldsville, Pa.,

as soon as the 50 ovens now under way at Eleanor shall have been completed. At Prescottville also arrangements are making for the building of 500 new coke ovens.

The Carnegie Steel Company's right to use the Harveyizing process in hardening armor plate without paying a royalty is being disputed by the Harvey Steel Company of Brills Station, near Newark, N. J., which has filed suit against the Carnegie Company to restrain them from using the process.

The Washington, Pa., steel and tin-plate mill will let the contracts, within a few days, for work and materials on an addition to its plant, which will double its capacity. About 150 men are now employed. A new engine, train of rolls, pickler and new tinning-house and ware-room will be erected.

The Lebanon Manufacturing Company, of Lebanon, Pa., has received an order for a large lot of castings. The contract includes 70,000 separate castings, weighing from 180 to 600 lbs. each. This work, it is said, will keep the company's plant in operation for more than a year without any other work.

The Bay State Aluminum Company, of Quincy, Mass., incorporated under the laws of the State of Maine, last week filed a voluntary petition in insolvency. The corporation had a capital stock of $100,000 and did a general manufacturing business of aluminum articles. No schedule of assets or liabilities was filed.

The Schoen Pressed Steel Company, of Allegheny, Pa., has been awarded the contract by the Pittsburg, Bessemer & Lake Erie Railroad Company for the construction of 600 iron ore cars to be completed by August 1st, at a cost of $600,000. A contract has also been made with three locomotive companies for nine powerful Mogul locomotives.

The Lebanon, Pa., Rolling Mills Company, whose Plant employs, when running full, about 800 men, made a deed of trust on April 6th for the benefit of creditors to S. E. Light, general manager, and W. H. Leonard. Failure to realize on supposedly available assets, now tied up in the hands of receivers or assignees, was the cause of the failure, superinduced by the continued stagnation in business.

The Illinois Steel Company's works at South Chicago were closed down this week, shutting out 4,000 employees. This action was taken by the management of the concern when it was learned that a strike had been ordered. They have been operating the steel mills for several months under the sliding scale of wages, and the employees have been dissatisfied.

The Braeburn Steel Company has been incorporated with a capital of $200,000, and William Metcalf, Philip B. Hasbrouck and Charles Metcalf as directors. The secretary and treasurer is David W. Dunlevy. The plant is being built at Braeburn, Westmoreland County, Pa., and is intended to make high-grade crucible tool steel and high-grade open-hearth steel.

The Osborne & Sager Coal Company has just completed a large car and repair shop at West Newton, Pa., which is being stockedwith the latest improved iron and wood-working machinery. This company owns over 200 railroad cars, and it is the purpose in establishing this industry to repair old cars and build new ones. It will also manufacture its own pit cars and other mining machinery.

The Pencoyd Iron Works of Philadelphia, Pa., has just entered into a contract with the Imperial Japanese Railway for 2,000 tons of structural steel, to be delivered in the form of 186 steel spans, the cash value of which is $75,000. This was secured in competition with the largest and most prominent manufacturers of structural steel in Europe, and is the first contract for this commodity ever secured by an American firm from the Japanese government.

The Robins Conveying Belt Company, New York, has installed a stone-crushing plant of 150 tons' capacity at Bernardsville, N. J., for Turnbull & Taintor, which includes several of their well-known conveyors. They had the entire contract for construction and machinery, most of the latter being of the Gates type. The Robins Company has also just completed a system of belts and conveyors for loading barges with trap-rock at Verplanck, N. Y., the capacity of which is 250 cu. yds. per hour.

The Standard Oil Company is about to erect at Bayonne, N. J., a boiler shop 300 ft. long and 105 ft. wide. The main portion of the shop is divided into three bays. The central bay, about 50 ft. wide, is served with a 15-ton electric crane supported on heavy girders about 40 ft. above the floor. On either side of this main portion is a wing about 30 ft. wide. The walls of the building are brick and the supporting framework is steel. The roofs are to be covered with corrugated iron. The main columns of the shop are 25 ft. apart, and all arranged so that jib cranes of suitable size and capacity can be attached at any point, which, together with the traveling crane in the center, will enable them to cover the entire floor surface of the building. One end of the building for a distance of about 75 ft. in length is supported by clear span trusses, which gives a clear floor space over this entire area. In this end of the building will be located fires and furnaces and other apparatus for heating and shaping the material for the boilers. The steelwork was designed and will be erected by the Berlin Iron Bridge Company, of East Berlin, Conn.

TRADE CATALOGUES.

The Detroit Lubricator Company, of Detroit, Mich., in its price list of the "Detroit" steam and hot-water radiator and globe valves, gives good illustrations and descriptions of the different styles which it manufactures. Their valves are high-grade articles and possess advantages not found in others of high standing.

P. F. Olds & Son, Lansing, Mich., manufacturers of gas and gasoline engines, have sent us a catalogue illustrating and describing the several kinds of engines they have for years placed upon the market with so much satisfaction to the many users. The engines are designed to develop from 1 to 50 H. P., and while particularly desirable for use where other power is not available, are economical and compare favorably with other small engines under all circumstances.

Messrs. J. & E. Wright, of Birmingham, England, have published a handsome book entitled "The Wire Rope and Its Applications." This firm is one of the oldest in England, and is well known in all parts of the world for its driving ropes and cables, and for its suspension bridges and aerial ropeways. Of course the book is intended primarily as a catalogue of the firm's manufactures, but the technical information contained in it makes it additionally valuable. The illustrations are excellent.

Messrs. John Davis & Son, of Derby, England send us their new catalogue of electric mining plant. This gives very complete information on the fitting up of mines with electric power and light, and instead of being a bare price list, it contains technical discussions on all the points to be considered in designing such plant. It describes also typical installations supplied by the firm, giving details of the cost of running from actual experience. The firm manufactures the Davis & Stokes dynamo for use in gaseous coal mines, and are agents for the Jeffrey coal cutter.

NEW PATENTS.

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 MARCH 30TH, 1897.

579,569. COAL SEPARATOR. Frederick H. Emery, Scranton, Pa. The combination with an inclined receiving-chute and deflecting-plate at the lower end of a succession of adjustable under and over chutes arranged in pairs and located in different planes.

579,589. STEAM SHOVEL OR EXCAVATOR. George W. King, Marion, O. The combination of an A-shaped boom or crane, shovel or dipper arranged to dig or excavate toward the machine's body portion and means for hoisting and lowering the shovel proper or dipper.

579,597. APPARATUS FOR HEATING BLOOMS OR OTHER ARTICLES OF METAL. Arthur J. Moxham, Johnstown, Pa. A furnace composed of a body and cover with necessary connections for heating the blooms by means of an electric current.

579,639. PROCESS OF AND APPARATUS FOR MAKING CYANIDES. Horace W. Crowther, West Bromwich; Edmund C. Rossiter, Smethwick; George S. Abright, Birmingham, and John J. Hood, London, England. Patented in England April 26th, 1894, No. 8,305. The method consists in treating iron with an alkaline sulphide or sulphide of an alkaline earth, mixing it with a sulpho-cyanide and then drying the mixture in the presence of an inert gas.

579,679. CONCENTRATOR. Clarence A. Holmes, Seattle, Wash. The combination of a spiral flume having a downward incline from end to end, means for rotating it about its central axis in a direction opposite the flow of water, and means in the flume for arresting and holding the metallic particles.

579,689 ACETYLENE GAS GENERATING APPARATUS. Joseph A. Vincent, Philadelphia, Pa. Assignor to the Electro Gas Company, of West Virginia. The combination of a water tank, a vertically-moving bell or holder floated by the water in the tank and carrying a carbide receptacle.

579,702. ACETYLENE-GAS-PRODUCING APPARATUS. Edward N. Dickerson, New York, N. Y. The combination with a tank of a holder for carbide and a condenser.

579,705. SMELTING FURNACE. James Douglas, New York, N. Y. A water-jacket furnace with wind-pipes passing through the water-jacket and connecting with the tuyeres.

579,750. MANUFACTURE OF ZINC OXIDE. Wilhelm Hampe and Carl Schnabel, Hanover, Germany. The process consists in subjecting an intimate mixture of finely-divided and dried zinc sulphate and finely divided carbon to an even and correctly-gaged temperature.

579,775. AIR-COMPRESSOR. Henry C. Sergeant, Westfield, N. J. Assignor to The Ingersoll-Sergeant Drill Company, New York, N. Y. The combination with an air-compressor discharge-valve having a stem of smaller diameter than its head, of an annular dashpot in which the portion of the head projecting around the stem of the valve is sheathed when the valve is open.

579,786. BLASTING-FUSE. Max Bielefeldt, Wittenberg, Germany. Fuses and match-cords of fiber impregnated with a drying-oil and a salt having high percentage of water of crystallization with diazo compounds and with albuminous bodies.

579,793. SEPARATOR. Elmer E. Ditch, Ashland, O. A screen composed of oscillating slats so shaped as to form meshes.

579,807. METALLURGICAL FURNACE. William Rotthoff, Duquesne, Pa. A blast-furnace provided with cooling-plates in its sides and having its mantel-plates provided with transverse openings adjacent to and of sufficient size to permit withdrawal of the cooling-plates.

579,814. FORGING-MACHINE. John R. Blakeslee, Cleveland, O. The combination with a reciprocating heading-die, of a transversely-moving gripping-die, an opposite stationary gripping-die, and mechanism connecting the heading-die and movable gripping-die

579,820. PROCESS OF TREATING BLAST-FURNACE SLAG. Alexander D. Elbers, Hoboken, N. J. The process of treating sulphurous blast-furnace slag in its ground or pulverized state, consists in superficially desulphurizing the slag and impregnating it with nitrosyl.

579,822. HYDRAULIC AIR-COMPRESSOR. Frederick A. Erbe, North Beach, N. Y. The air is compressed by the weight of water contained in a tank and controlled by suitable valves.

579,840. COAL AND MINERAL WASHER. Erskine Ramsay and Ernest Dreyspring, Birmingham, Ala. The combination with the washer-chamber and the gate-valves therein, the sludge-tank and discharge valve therefor, of mechanism controlled by a driven part of the apparatus for automatically and alternately operating the gate-valves.

579,866. APPARATUS FOR SOLIDIFYING CARBON DIOXIDE. Herbert S. Elworthy, Bandra, India. The apparatus consists of a compressor having a series of cylinders arranged for serial compression, a regenerative refrigerator, an expansion engine operating a compression cylinder and having its expansion cylinder connected with the regenerative refrigerator.

579,872. PROCESS OF TREATING AURIFEROUS AND ARGENTIFEROUS ORES. Joseph H. Haycraft, Adelaide, South Australia. Assignor to the Haycraft's Gold Extraction Company, Limited, same place. The process consists in introducing the ore into a pan adding thereto mercury and soluble salts capable of yielding chlorine by electrolysis raising the ore contents of the pan to about the boiling point of water and passing a current of electricity through the heated mass to secure a simultaneous electrolytic chlorination and electro-amalgamation.

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 manufactures 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.

ALASKA.

ALASKA JUNEAU GOLD MINING COMPANY.—This company, which recently purchased the Lane Campbell properties, is preparing to thoroughly prospect the ore body by sinking a 1,000-ft. shaft, keeping its 40-stamp mill in operation on the rock taken out. If the ore body is continuous, a large mill will be erected on tidewater, and an electric plant on Salmon Creek. To connect mine and mill an electric railway may be built.

BERNERS BAY MINING AND MILLING COMPANY.—The long tunnel to tap the Comet was driven by this company a distance of 1,875 ft., and tapped the ledge at a depth of 1,000 ft. At this point they drifted on the vein for about 40 ft. and then started an upraise to meet the sinking from above. The distance from the upper level to the lower tunnel level is 500 ft. Of this 130 ft. have been driven on the upraise, and the shaft above has been sunk 230 ft., leaving about 140 ft. to be driven to make the connection. Upward of 1,000 tons of ore have been stored in the tunnel and ore bins outside pending the opening of communication between these two points.

ARIZONA.

YAVAPAI COUNTY.

GOLD RING.—Bert Morton is working this mine on Cherry Creek, under bond and lease. It is developed by three shafts—140, 160 and 100 ft. deep—showing ore which runs from $16 to $20 per ton. The 5-stamp mill is in operation.

JERSEY LILY.—The shaft in this mine is 370 ft. deep. In addition to an old level, run at a depth of 30 ft., there are three levels run, one at each 100 ft. of depth. At the 200-ft. level a south drift is in 250 ft. and a north drift 180 ft. The latter is in good high-grade ore all the way, while the former is also in ore, part of which is high grade and part in ore of lower grade, but good milling ore. At the 300-ft. level the north drift is in 110 ft., with a solid body of ore all the way, averaging from 3 to 4 ft., and with a fine body of high-grade ore on the face of the drift. The south drift is in 100 ft.; the ore is of lower grade.

CALIFORNIA.

CALIFORNIA STATE MINERS' ASSOCIATION.—A meeting of the executive committee of the association was held March 31st. A resolution was adopted to appoint a committee to confer with one to be selected by the Anti-Debris Association for the purpose of jointly urging Congress next winter to appropriate some $600,000 for the construction of restraining dams and dredging the navigable rivers in California. It is the intention to use this additional money after the $300,000 appropriated by the last legislature for dredging the Sacramento River and the $250,000 given by the State and a similar sum given by the last Congress for restraining dams is expended. The committee appointed to confer with one from the other association consists of Daniel T. Cole, J. H. Neff, E. Coleman, J. O'Brien

and Tirey L. Ford. President Neff and Secretary Sonntag were added to the committee recently appointed to confer with the United States Debris Commissioners regarding the location of the proposed restraining dams. Mr. Sonntag, who recently handed in his resignation as secretary on account of the pressure of his private business, was prevailed upon to continue in office until the annual convention next fall.

AMADOR COUNTY.

(From Our Special Correspondent.)

ANITA.—At this mine, one-half mile southwest of Jackson, on the 500-ft. level, drifts have been run to the south 80-ft., and to the north 200-ft., both in good ore, which will average about $6 per ton.

KERN COUNTY.

ST. ELMO MINING AND WATER COMPANY.—This company, which owns the St. Elmo mine in the Randsburg District, proposes to sink a shaft 500 ft. deep in the property.

NEVADA COUNTY.

(From Our Special Correspondent.)

DIAMOND CREEK CONSOLIDATED MINING COMPANY.—This mine, formerly known as the Eagle Bird, at Maybert, is to be re-opened by the Oak Tree Mining Company. All claims against the company are being settled.

PLACER COUNTY.

BELL UNION.—One-half interest in this mine has been sold for $4,000, to Peter A. Hart. The mine is owned principally by Henry M. Bayne, and is situated on the American River, not far from Auburn. The ledge is 4 ft. thick and has been cut in many places.

FRENCH HILL —This quartz mine, in Spanish Dry Diggings District, near Butcher Ranch, has been sold to J. H. Galey, of Pittsburg, Pa.; price said to be $40,000. The mine was the property of State Printer A. J. Johnston. A 10-stamp mill is on the ground, and a Wilfley concentrator has arrived at Auburn. The ledge is about 40 ft. in width and prospects well in free gold. The sulphurets are quite rich.

PLUMAS COUNTY.

(From Our Special Correspondent.)

PLUMAS-IMPERIAL.—This mine, near Quincy, has resumed active operations. A large restraining dam and settling reservoir has been put in order. They have a fine water privilege.

SHASTA COUNTY.

(From Our Special Correspondent.)

GREAT BEAR.—This mine, located about 2 miles west of Keswick, comprising five claims, was recently sold to this company by George Hoffschneider. The claims are on the same ledge as the Iron Mountain and the Brown Bear mines. The property has been developed by three tunnels 25, 110 and 200 ft. respectively, and another one is now being started to cut the vein at a depth of 250 ft. The vein averages 1½ ft. and assays show from $17 to $27 free gold.

POTOSI.—This mine, 12 miles southwest of Redding, owned by John P. Jones, is to be reopened. The mine closed down 30 years ago on rich ore, the mine having filled with water.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

APP.—All the force at this mine, on Quartz Mountain, is being concentrated at the 800-ft. level, where crosscutting, drifting and stoping is being carried on. The ledge at this level where stoping is being done shows 20 ft. of well-defined high-grade ore. The sinking in the main shaft will be continued in June.

DUTCH.—At this mine, on Quartz Mountain, the crosscutting and drifting continues. On the 200-ft. level they are stoping some high-grade ore.

EAGLE & SHAWMUT.—These mines, located 2½ miles northwest of Jacksonville, are being worked together. The shaft in the Eagle tunnel, now down 500 ft., is being sunk rapidly, and the connection of the Eagle and the Shawmut tunnels has just been made, which insures good air. On the 150-ft. level the vein shows rich. The new mill is nearing completion.

ORO GRANDE.— At this mine in Hostetter's Gulch 6½ miles northeast of Trinity Center, the tunnel run about 300 ft. has tapped the ledge at a depth of 700 ft. below the surface. The vein 5 ft. in width is very rich. Last year it is estimated that $200,000 was cleaned up. One run of 29 days with the 5 stamp mill yielded $39,000. The mill is down the mountain about a mile.

WONDER.—This mine, at Big Oak Flat, has developed a pay chute 10 ft. in width. The ore averages about $8 free milling. Besides the regular milling ore, pockets are struck occasionally from which from $50 to $300 are taken out. The ore is milled very cheaply.

COLORADO.

(From Our Special Correspondent.)

ARBITRATION LAW.— The Colorado Assembly has passed an arbitration law providing for the adjustment of differences arising between employers and employees. The great Leadville strike of eight months was investigated by a special legislative committee which recommended such a law and the passage was the result, it being introduced by Senator Carney, a noted leader of labor measures. The constitution of Colorado prevents compulsory arbitration, but this is provided for by an agreement for the settlement of the differences by such a board. The act creates a State board consisting of three members to be appointed by the Governor. Among the provisions of the law the following are important: That whenever any grivance or dispute of any nature shall arise between employer and employees, it shall be lawful for the parties to submit the same directly to the State board, in case such parties elect to do so, and shall jointly notify the board or its clerk in writing of such desire. Whenever such notification is given it is the duty of the board to proceed with as little delay as possible to the locality of such grivence or dispute, and inquire into its cause or causes. The parties to the grievance or dispute must submit to the board in writing, clearly and in detail, their grievances, and severally agree in writing to submit to the decision of the board as to the matters so submitted, agreeing to continue on in business or at work, without a lockout or strike, until the decision is rendered by the board, provided such desision is given within 10 days after the completion of the investigation. The board must thereupon proceed to fully investigate the matters in controversy. After the matter has been fully heard, the board, or a majority of its members, shall, within 10 days, render a decision thereon in writing, signed by them or a majority of them, stating such details as clearly show the nature of the decision and the points disposed of by them.

Whenever a strike or lockout occurs or seriously threatens in any part of the State, and comes to the knowledge of the members of the board, or any one of them, by a written notice from either of the parties to such threatened strike or lockout, or from the mayor or clerk of the city or town, or from the justice of the peace of the district where such strike or lockout is threatened, it is their duty, and they are directed, to proceed as soon as practicable to the locality and endeavor by mediation to effect an amicable settlement of the controversy. The parties to any controversy or difference may snbmit the matters in dispute in writing to a local board of arbitration and concilation; such board may either be mutually agreed upon, or the employer may designate one of such arbitrators, the employees or their duly authorized agent another, and the two arbitrators so designated may choose a third, who is to be chairman of the local board; such board shall in respect to the matters referred to it have and exercise all the powers which the State board might have and exercise, and its decisions are to have such binding effect as may be agreed upon by the parties to the controversy in the written submission. The jurisdiction of the local board shall be exclusive in respect to the matter submitted to it, but it can ask and receive the advice and assistance of the State board. Such local board shall render its decision in writing within 10 days after the close of any hearing held by it, and shall file a copy thereof with the secretary of the State board.

EL PASO COUNTY.

BIG FOUR GOLD MINING COMPANY.—The Hassell Iron Works Company, of Colorado Springs, is erecting 20-ton concentrating works for this company, on East Beaver Creek, in the Cripple Creek District. The property of this company is situated about 22 miles from Colorado Springs, a short distance from the road from that point to Cripple Creek. A Crawford crusher, Cornish rolls and Woodbury concentrator will constitute the plant, which is a novelty in the Cripple Creek District, as thus far very little ore for concentrating has been produced there.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

BRODIE CYANIDE MILL.—This mill treated 1,140 tons of $23 ore during March.

CHAT.—This group of claims, on Carbonate Hill, one mile north of Cripple Creek, was the scene of a reported big strike about 6 ft. from surface. The property, containing about 30 acres, is under lease and bond to Jennings Bros. and partners. The vein varies from 6 to 12 in. and consists of talc and quartz.

ELKTON CONSOLIDATED.—This property, on Raven Hill, for the 18 months commencing September 1st, 1895, to February 28th, 1897, produced ore of a gross value of $655,467, or at the rate of $36,415 per month, whereas for the last ten months terminating February 28th the gross output was $528,114, or $52,811 per month. The mine has paid $226,960 in dividends. January, 1897, was the banner month, with a gross value of $80,948, net value $72,752, with a total force of 88 men. The surplus in the treasury is over $225,000.

EL PASO CHLORINATION MILL.—This mill, at Gillette, treated during the month of March 1,400 tons of ore of a value of $27.50 per ton.

INGHAM CONSOLIDATED.—This mine, on Raven Hill, under the management of Mr. Dickerman, had an output for March of about 300 tons, 100 tons of which was high-grade smelting ore and the balance milling ore.

ISABELLA MINING COMPANY.—The output of this company for March was 1,050 tons, 350 tons of which was fairly high-grade smelting ore and the balance milling ore. The Lee 3-compartment shaft has been sunk 396 ft.

ORPHAN BELLE GROUP.—The Maloney lease strike, which was made about five weeks ago, has shipped at the rate of 100 tons a week, the rock averaging close to $70 a ton. None of the rich ore has yet been shipped. The ore chute is fully 80 ft. in length.

UINTAH TUNNEL.—This tunnel, which has pierced Battle Mountain 100 ft. from the north from Arequa Gulch, has just resumed operations after a close-down of several months. The tunnel is owned by James Doyle, one of the incorporators of the Portland Company, and will relieve that group of claims of part of its surface water.

WORK MINING COMPANY.—This company, developing the Morning Glory claim at Anaconda, recently made two car lot shipments, one of $60 ore and one of $20 ore. This property has been worked several times by lessees, but not successfully. The shaft has been sunk 225 ft.

GILPIN COUNTY.

(From Our Special Correspondent.)

BUELL.—The preliminary work in connection with the reopening of this mine is nearly finished, and it is hoped to recommence sinking the shaft very shortly. Meantime exploration work is being carried on, mainly east of the shaft, where it is said a good deal of pay ore is being opened up, from which Mr. Dickey hopes to keep 20 or 25 stamps running at the Bobtail mill. The Buell is another case of reworking a vien which has been one of the best producers in the district, and which, given sufficient development work ahead to make up for the bunchiness which necessarily distinguishes the payable portions of fissure veins, should give a good account of itself.

GREGORY-BOBTAIL.—An editorial in the *Engineering and Mining Journal* for March 20th, referring to this enterprise, has attracted considerable attention and criticism here. It is true that one particular organization of these properties failed to achieve success, but it is possible to make far too much of this circumstance, the main cause of which was certainly not the poverty of the veins. These two veins have been, on an average, among the most, if not the most, productive in Gilpin County, and so far from being "worked out," are not yet worked to one-third the depth at which the working costs ought to show any notable increase. It is probable that the actual bottom of each mine is not showing at its best, but there is no evidence of any general decrease in productiveness of either vein, and with sufficient patience and outlay on the part of Eastern investors there is every probability of both mines proving productive. Such at any rate is the opinion of everybody here who knows the facts and is competent to judge.

There is a strong prejudice in Colorado against any person who ventures to publish unfavorable facts respecting any local enterprise, even in the case of exposing an obvious swindle. It is fancied that the publication of such facts, however true, is apt to discredit the district in the eyes of outside investors. Your correspondent holds the contrary opinion—that the best way to recommend a mining camp to outsiders is to tell the truth about it, and that any mining district which cannot stand this treatment does not deserve the attention of outside capital. All the more, however, he feels it incumbent upon him to correct, as far as possible, statements which do not seem to do justice to the actual facts.

KANSAS.—Sinking has been recommenced in the main shaft, now 1,350 ft. deep, the deepest working on the Kansas vein. This has always been considered one of the strongest and most productive veins in the county, and its western end (owned by the Gold-Coin Mines Company, of New York) has been among its best portions. Great hopes are entertained locally that this mine, vigorously opened up, may prove as good a producer as their other property, the Hidden Treasure. Worked some years ago by an English Company, under the name of the Denver Gold Company, Limited, the Kansas mine paid few if any dividends. This experience, however, has hitherto been the rule with English corporations in this part of Colorado, the returns to the English stockholders having generally been insignificant, although the mines themselves have frequently been productive.

NEXT PRESIDENT.—The shaft house and plant lately used on the Smith mine, in Chase Gulch, are being removed and re-erected on this mine.

GUNNISON COUNTY.

(From Our Special Correspondent.)

CZAR.—The shaft on this property at a depth of 37 ft., has just encountered a rich vein of agatized quartz.

GOLD FINCH TUNNEL.—This tunnel, at Dubois, is in 105 ft. and shows ore in the breast running $35. A crosscut is now being run to determine the width of the vein.

MAMMOTH CHIMNEY.—W. J. Wolfe, one of the original locators of this mine, has sold his interest in that property to R. B. Wallace, of Michigan, for $2.000 cash.

VENABLE.—The 100-ft. crosscut has just been completed after encountering the vein which shows a width of 30 ft. of good ore.

LAKE COUNTY.

(From Our Special Correspondent.)

BRUSSELS.—Recent development work in this property goes to prove that it is developing into a big mine and much important work will be prosecuted this spring. The working force has been increased again and shipments will begin just as soon

as the roads are passable. The Brussels is nearly eight miles from the smelters.

Eclipse.—Denver parties who are at the head of the Winan lease on this property intend pushing active development work at once. It is the intention to push down the shaft and then drift to catch the ore body. Bids to sink the shaft 140 ft. or more will be opened this week.

Elk.—The lessees on this property, who have been doing a great deal of new development work since opening up the big iron ore body early in March, now have the iron chute well blocked out and this week they increased their working force and have begun shipping in earnest.

Leases.—A trip over the hills show that there are to be many more leases operated this year than in the past. In many cases two and three men are to be seen at work on what have been abandoned properties. Some of them are not making a cent, but while the downtown mines are still idle and these men have nothing to do they are in many cases at least making a living from their small monthly shipments. It is fortunate for Leadville that it is not inflicted with exorbitant rates of royalties to the small lessee. The royalty here ranges from 10% to 40%.

New Development Work.—There is an undercurrent of discussion in mining circles in regard to new enterprises which are being projected throughout the district. The development and prospect work this summer will be pushed along several well-defined lines. It will be to the north, in a a search for the continuation for the Fryer Hill ora chutes across Big Evans; to the east, to prove up the Resurrection chute extending easterly to Mosquito range; to the south, to find the continuation of the Lillian ore chute, and to the southwest, to find the Stone chute, which has already been opened up on Rock Hill in the Nil Desperandum. If all goes well the probable development to the southwest of the downtown chutes can be added to the future plans for this year. At the present writing the two sections of the camp that are to come in for special attention this year are the Big Evans Gulch and the Iowa Gulch sections.

Next President Mining Company.—Articles of incorporation of this company were filed here this week. The capital stock of the new company is $100,000, and the incorporators are F. N. Bankroft, A. C. Bartels and James E. Kirk.

Rex.—Relative to the starting up of this property, a detailed description of which appeared in the *Engineering and Mining Journal* two weeks ago, I am informed by Manager Johnson, of the new Keystone Company, that inside of 30 days work will be actively under way. Of course there is considerable snow to contend with in this section of the gulch, and it is not the intention of the company to be hampered after work is inaugurated. Additional machinery is to be secured.

Union Smelter.—This plant, which was sold out by the sheriff some months ago to satisfy a deed of trust, is still idle. It is learned, however, that the Union may start up at an early day if certain arrangements now under way are carried through.

OURAY COUNTY.

(From Our Special Correspondent.)

Bachelor No. 2.—E. L. Thompson, who is driving this tunnel on Mt. Hayden, under contract, has added a night shift. The breast is now in 137 ft. and is following a small stringer of rich ore in the short quartzite.

Caroline Mining Company.—The Revenue is again working at full capacity, employing about 500 men.

Loder Pyritic Reduction Company.—This company has concluded not to locate its plant at Ouray, and is now in search of a more promising field. This change is owing to the near completion of the Fowler smelter and the probable location of a similar plant at this point in the very near future.

U. S. Mill.—It has again been demonstrated that, without proper management, the U. S. Mill cannot be made to pay, and it has been found expedient by the late lessees to close down once more. Various parties have tried in vain for several years to make a success of this mill, but up to date all such efforts have resulted in signal failure. The U. S. Mill is near the Revenue, about 6 miles southwest of Ouray, and the in center of a good gold-bearing section.

PITKIN COUNTY.

Mollie Gibson Consolidated Mining and Milling Company.—The recent strike in the Mollie Gibson, owned by this company, was encountered in the 13th level, and, it is reported, will average about 37 oz. silver per ton.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

Cement Creek Gold Mining Company.—This corporation, organized at Colorado Springs, has secured the Sampson property on Bonito Mountain, near Gladstone, and if satisfactory reports are returned by their representative, Judge Jackson Orr, who is now examining the title, work will be begun on an extensive basis at once. The Sampson is considered one of the richest gold mines in the State.

Denver.—This property is in Hancock Gulch. The tunnel is in 200 ft. on the vein, 60 ft. of which followed a 6-in. streak of high-grade silver ore.

Enterprise.—This mine, owned by Denver and Telluride men, is under lease to J. W. Hackett & Company, experienced Red Mountain miners, who have been developing it since January 1st. They have in their ore house over 300 tons of heavy iron and copper sulphides which average 10 oz silver, $4 in gold and $7 in copper per ton. This mine is developed by a 300-ft. tunnel from the end of which the lessees have crosscut south, following an irregular chute of this class of ore. This crosscut is now nearly 60 ft. long and the last 15 ft. have been driven through a solid mass of this same kind of ore 12 ft. between walls. This ore chute seems to be nearly vertical, but as the breast of the crosscut is still in ore the length of the chute is uncertain. Stoping will be commenced here as soon as the railroad is open to Silverton.

Hercules.—W. Wilson and others are pushing operations on this mine, on Sultan Mountain, which is an extension of the Empire.

New Guston Mines Company.—This company, in the Red Mountain mining district, is working 22 men on this property all work being confined to the fourth and 14th levels. On the fourth level a new drift is being run to open up a block of ground below the third level 75 × 45 ft. in size. This block of ore was left untouched by Captain Harvey, in the early days of this mine, as being too low-grade to handle, but it is now believed this ore can be profitably mined when shipped to the pyritic smelter at Silverton, where this class of base copper and iron ore is in great demand. If a good chute of ore is encountered in this fourth level, the virgin blocks above the third and second levels will be explored. On level 14, after running 40 ft. from shaft, a vein has been cut, apparently 2 ft. wide, containing good grade copper, gold and silver ore. This vein is now being prospected. Nearly 600 tons of copper and iron sulphides are stored in the Guston ore house and as soon as the Silverton Railroad is freed from its annual snow blockade, this will be shipped to Silverton and the smelter there will then "blow in" again.

Pearl.—Sam Beaver and others will begin work at once. They are now engaged in running prospecting drifts to strike the vein which paid them well last fall, but which then suddenly pinched out.

Scotia.—Some rich gold ore is being taken from this property, located at Scotia camp.

St. Paul.—This mine is ready to produce several cars daily of sulphide copper and iron for the Silverton Smelter, if the labor troubles and attachment suits of last year against this property can be satisfactorily adjusted.

Sultan Tunnel.—Work will shortly be commenced again upon the old Sultan tunnel belonging to the Silverton Mining Company which owns the North Star group of mines on Sultan Mountain near the town of Silverton. This tunnel is now in over 1,000 ft., but work was abandoned on it several years ago, and the North Star vein never encountered. It is now estimated that an extension of 50 ft. will cut the big vein and thus open up the eastern portion of this company's territory. These mines were discovered where the lode crosses what is called North Star Gulch, and first worked by adit levels on the lode from the east side of the gulch. As the lode runs parallel to the mountain it was found to catch such a flow of water from above, that, in order to avoid sinking and pumping, the system of crosscut tunneling was adopted. Six large working tunnels have been driven by this company, varying in length from 230 to 2 317 ft.; and the lode, wherever tunneled for, has been found in place, without fault, from 10 to 20 ft. in width and well mineralized. There has been extracted from these mines and sold to the smelters (of which there is a complete record), 24,500 tons of smelting ore, and there has been milled 25,000 tons of low-grade ore from which 5,500 tons of concentrates were marketed. The 50,000 tons of ore and concentrates sold contained 8,100 oz. gold, 1,410,000 oz. silver and 15,000,000 lbs. of lead. The average per ton of ore was 0.27 oz. gold, 47 oz. silver, 25% lead, beside some value in copper, which has shown a gradual increase with greater depth. About 18,500 tons of the smelting ore and the greater part of the mill dirt came from the North Star Lode; and about 6,000 tons of smelting ore from the Crown Point lode. The general average in values from the two lodes does not differ greatly, but silver and lead are higher and copper and gold are lower in the North Star, while the reverse is true of the Crown Point. From a large amount of ores first sold little was realized from gold contents, but as depth has been gained the amount of gold has gradually increased, while silver has decreased. With depth the sulphides of copper and iron have largely increased, while lead has shown a falling off. It seems reasonable to suppose that the extension of the Sultan tunnel will encounter the continuation of the North Star lode and its progress will be watched with interest by mining men.

Several sets of lessees are at work in the upper drifts of this mine and the large amounts of sulphide ores they have taken out are being purchased by the Silverton matte smelter.

Sunnyside.—This property, under the direction of Judge Terry, is storing its ore while waiting for an increase in the water supply sufficient to start up the mill. Six men were working all winter.

Yankee Girl.—No work is being done at the mine at the present time. Last year several thousand dollars were expended running drifts from the bottom of the shaft, but no permanent ore bodies of any value were encountered. It would seem that the results of recent development work on this property have been so discouraging because not done with the system and comprehensiveness that characterize the management of the neighboring Guston mine.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

Belle-Champion.—This mine, at Saw Pit, J. Albert McKay, manager, is shipping a carload per day of $60 gold and silver ore from a contact vein 4 ft. thick. There are 250 carloads of mineral blocked out in the mine.

Butler.—This property, near Ophir loop, is owned and operated by F. P. Mogensen, of Ames. The high-grade ore runs $90 a ton in gold, silver and lead, and amounts to about two cars per month.

Caribbeau & Montezuma.—About 50 men are at work on these properties. Among them are several sets of lessees who are making much better than wages. The ore runs from $75 to $100 per ton, principally in silver and lead, the gold values only averaging from $7 to $10. A small force of company men under Chas. S. Newton, resident manager, is breaking ore to supply the concentrating plant, near the mines. The capacity of the mill will be increased the coming summer.

Hector Mining Company.—This company is driving a tunnel on the vein of the Ophir and Shamrock, middle basin, to intersect the lead of the Montana properties in the same basin, at a great depth. The tunnel is in 600 ft., and will be about 1 800 ft. in length.

Lizzie G.—The Saw Pit District is again assuming its old-time activity. Mr. W. W. Morrison, B. W. Sherick and J. McNeill, of Denver, are here in the interest of New York parties contemplating purchasing the Lizzie G. mine.

Occidental.—This property, near the Tom Boy and Japan, Savage basin, is being examined by an expert on behalf of Eastern capitalists who contemplate purchasing it. The mine is a gold proposition and has produced rich mineral.

Silver Bell.—This property, near Ophir Station, owned by St. Louis parties, is being worked under lease by E. E. Bassett and G. W. Goebel. Several carloads of high-grade mineral are shipped per month.

Valley View Gold Mining Company.—Recent development has broken into rich gold quartz. The ore runs from $40 to $110 per ton, most of the values being caught on plates by amalgamation.

GEORGIA.

LUMPKIN COUNTY.

Appalachian Gold Mining Company.—This company has completed its organization by electing the following officers: President, W. W. Murray; vice-presidents, W. M. Duncan, John P. Williams; secretary and treasurer, H. P. Kirkpatrick. The company has its headquarters in Nashville, Tenn. It has secured options on several mines near Dahlonega and proposes putting up a mill at a central point. The contract for a chlorination plant has been let to C. E. James & Co., of Chattanooga, Tenn., and work will soon be begun.

Calhoun.—At this mine, near Dahlonega, which is operated by Capt. John Huff, a rich pocket was recently found. The clean-up was very satisfactory to the operators.

Minnie.—An option on this mine, near Dahlonega, has been taken by the Appalachian Gold Mining Company. Mr. J. P. Stegall, the owner, has been working it in a small way.

Singleton.—This mine, near Dahlonega, is worked under lease by Capt. John Weaver. A shaft has been sunk about the center of the old open cut and is now down 200 ft. A tunnel has been started at the base of the hill which is expected to reach the ore body in about 160 ft. Some ore is being taken out from the shaft and worked in the old mill.

IDAHO.

OWYHEE COUNTY.

De Lamar Mining Company, Limited.—Mr. D. B. Huntley, the manager of this company's mine at De Lamar, reports as follows for the month of February: Crushed (wet) 3,545 tons; crushed (dry), 3,190·5 tons; assay value of pulp, $18.19, of which $15.29 was gold and $2.90 silver; assay value of tailings, $5.14, of which $4.45 was gold and 69c. silver; total percentage saved, 71·75; number Doré bars produced, 9; number ounces fine gold produced, 1,649·551; number ounces fine silver produced, 13,506·32; value of gold produced, $32,991; value of silver produced, $8,779; ore sales (estimated), $700; miscellaneous revenue, $95; total, $42,565; expenses for the month, $38,032; estimated profit for the month, $4,533.

IOWA.

WAPELLO COUNTY.

Dispatches from Ottumwa say that 600 miners have struck against a reduction from 70 to 60c. The mines affected are those of the White Breast at Keb and Chisholm, Evans Mine at Avery and Chicago and Iowa mine at Cedar Mines. Other operators will follow the cut and the other men will doubtless go out. The operators are worrying little, as they claim they have been losing money on account of the demoralized coal trade, and really do

not care to reopen their mines for a time. The men are orderly.

MICHIGAN.

COPPER.

ATLANTIC MINING COMPANY.—The output reported for March is 293 tons copper, an increase of 16 tons over the February report.

CENTRAL MINING COMPANY.—At the annual meeting of stockholders in New York April 5th the following officers were elected for the ensuing year: President, Joseph E. Gay; directors, J. E. Gay, R. Porterfield, J. R. Stanton, Wm. C. Sturges, John Stanton, E. A. Day and James Dunstan; secretary and treasurer, John Stanton.

FRANKLIN MINING COMPANY.—The March production is reported at 151⅛ tons of copper, as against 145½ tons for February.

WOLVERINE MINING COMPANY.—This company produced 107 tons of copper in March, against 105 tons in February.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The purchases last week did not equal the production and zinc ore is accumulating, which will have a tendency to lower the price. The sales of zinc ore were 12 carloads less, and lead ore 1 carload less than the preceding week. Compared with the corresponding period last year the sales were an increase of 6 carloads each of lead and zinc ore. The highest price paid for zinc ore was $21 per ton for a third of the Joplin shipment and for the ore sold at Oronogo. At all other camps the top price was $20 per ton. Lead ore brought $18.25 per 1,000 lbs. delivered all the week. The same time in 1896 zinc ore sold at $23 per ton top and lead ore at $17 per 1,000 lbs. Following are the sales of zinc and lead ores for the week ending April 3d: Joplin zinc, 846,610 lbs.; lead, 273,660 lbs; value, $13,460. Carterville zinc, 863,790 lbs; lead, 227,190 lbs.; value, $11,856. Webb City zinc, 629,590 lbs.; lead, 24,840 lbs.; value, $6,117. Galena zinc, 3,650,000 lbs.; lead, 795,430 lbs.; value, $47,438. Aurora zinc, 495,000 lbs.; lead, 35,000 lbs.; value, $3,700. Oronogo zinc, 85,850 lbs.; lead, 14,010 lbs.; value, $1,088. Alba zinc, 148,000 lbs.; value, $1,489. District totals for last week: Zinc, 6,718,840 lbs.; lead, 1,370,130 lbs.; value, $85,139. District totals for 13 weeks: Zinc, 81,514,750 lbs.; lead, 16,946,780 lbs.; value, $1,034,250.

BIRTHDAY COMPANY.—This company's plant is running steadily on rich dirt. They started up March 30th from 150 tubs of dirt, made over 7 tons of high-grade zinc ore and 7,000 lbs. lead ore. They sank a new shaft in which at 83 ft. a drift has good dirt in bottom and sides.

GET THERE MINING COMPANY.—Both of the company's pumps broke down last week and let the water up in several of the drifts that were being worked and reduced their output. There are seven producing shafts on their lease near Carterville.

HERALD MINING COMPANY.—This company has an 80-acre tract of the Connor land, south of Webb City, on which they built a plant several years ago, that has been idle until within a few weeks, when a large face of zinc ore was found at 185 ft.

MONTANA.

FERGUS COUNTY.

SPOTTED HORSE.—News comes from Maiden that the owner of the Spotted Horse mine, J. L. Bright, of Columbus, O., is prepared to pay all debts, including claims for wages, and that a full force of men is employed at the mine and mills.

JEFFERSON COUNTY.

NEW ELKHORN MINING COMPANY, LIMITED.—Mr. Walter S. Kelley, manager of this company's mine at Elkhorn, reports for the month of Feoruary shipments of bullion estimated at $24,076; surplus of January, $791; net value of bullion, $24,867; returns from ore shipped, $3,791; total receipts, $28,658; current expenses, $23,489; profit for February, $5,169.

LEWIS & CLARKE COUNTY.

DIAMOND HILL GOLD MINES, LIMITED.—About 70 men are employed at this property under Col. Thomas Ewing, manager. The vanner-room of the new mill, which will be 280 ft. long, has been raised; also the main building. The vanner-room will contain 56 Union ore concentrators.

NEVADA.

STOREY COUNTY—COMSTOCK LODE.

HALE & NORCROSS MINING COMPANY.—The Grayson board of directors, who claim to be legally entitled to the control of this company, have begun a fight in the courts for the posession of the mine. Joseph R. Ryan, the Grayson superintendent of the Hale & Norcross mine, has filed an affidavit in the Supreme Court of Nevada at Carson for a peremptory writ of mandamus, and James Cronan, the Fox superintendent, has been served with notice of motion to be made on April 10th for a peremptory writ of mandamus, requiring him to surrender and deliver immediately to Ryan the property of the company and to admit him to the use and enjoyment of the office of the superintendent of the company. The April term of the Nevada Court began April 5th, but under the statutes 10 days' notice of application must be given when application is made on notice.

NEW MEXICO.

SOCORRO COUNTY.

(From an Occasional Correspondent.)

WATER CANYON DISTRICT.—This district, consisting of Water Canyon, Copper Creek and Six Mile Creek, is making a record for itself as a gold producer. One mill is in successful operation, day and night. Several properties are in the course of development which will require other mills. The ore bodies are large, averaging from 4 ft. to 10 ft. in width, and milling from $5 to $40 in gold per ton. Timber and water are abundant. The camp is about eight miles from Water Canon Station, on the Magdalena Branch of the Atchison, Topeka & Santa Fe Railroad, from which point there is a good wagon road. The district is in the Magdalena Mountains, and about 18 miles west of the town of Socorro.

PENNSYLVANIA.

ANTHRACITE COAL.

DELAWARE, LACKAWANNA & WESTERN COAL COMPANY.—This company has decided to abandon its Avondale mine, near Plymouth, into which water has been finding its way at an alarming rate, presumably from the Susquehanna River, under which the workings extend. The pumps, pipes and machinery are being taken out. This complicates the situation very much for the Lehigh & Wilkes-Barre Coal Company, whose extensive Nottingham colliery adjoins the abandoned mine, and into which the water is also flowing to some extent.

LEHIGH VALLEY COAL COMPANY.—Maltby Colliery, at Forty Fort, near Wilkes Barre, was destroyed by fire on April 2d, which originated from an unknown cause. The boiler-house which supplied steam to the breaker engine was also burned. The loss is $65,000; insurance, $50,000. The capacity of the breaker was about 1,500 tons a day, and in conjunction with the mine employed 750 men and boys.

UTAH.

JUAB COUNTY.

PICNIC.—A strike of ore was made in this property a few days ago. The streak at present is small, but the ore is very good grade, carrying silver, lead and gold. The ore was encountered on the 375-ft. level, from which a crosscut was run.

TRIUMPH.—An important strike was made in this mine recently at a depth of 100 ft. The ore body is 4 ft. wide and shows an average of 30 oz. silver and 23% lead. The Triumph ground lies between the Undine and Sunbeam. Stoping will commence at once.

SUMMIT COUNTY.

ONTARIO NO. 3.—The strike made on the 1,100-ft. level of this mine, near Park City, is likely to prove important. The ore body has been uncovered for a width of 10 ft., the face of the crosscut having not yet passed through it. Two feet of the ore is high grade, assaying 196 oz. in silver and 41½% lead. The balance is good mineral and contains considerable free milling ore. It is on the main ledge. The crosscut in which the strike was made is 90 ft. in length and will be continued south to reach another spur of the ledge which has been uncovered on the 1,000-ft. level.

TOOELE COUNTY.

MIGNON GOLD MINING COMPANY.—The following are the newly elected officers: F. H. Nelden, president; George Z. Edwards, vice-president; G. L. Green, treasurer; George F. Sprague, secretary; H. M. Abbott and W. W. Stoddard. The company has lately added to its holdings in Camp Floyd District, until now it possesses 15 claims in a group extending from the summit to within a half mile of Mercur mill on the west side of Manning gulch. The working tunnel is in 75 ft., from which some good assays are said to have been obtained.

SACRAMENTO GOLD MINING COMPANY.—A rich strike of ore was recently made in the Sacramento, owned by this company. The real magnitude of the discovery has not yet been determined.

VERMONT.

ORANGE COUNTY.

(From an Occasional Correspondent.)

ELIZABETH COPPER MINE.—An adit is being driven into this copper mine, near South Strafford, to cut the vein 400 ft. under the shaft-head, or 100 ft. deeper than the mine workings have been driven. This will afford a gravity outlet for a large quantity of ore which otherwise would have to be hoisted.

ELY COPPER MINE.—This mine, near West Fairlee, seven miles north from the Elizabeth, is being prospected by levels beginning at the ore chute and driven either way along the vein. It is said that good ore bodies have been discovered. Although the chute was followed downward for 3,300 ft. along the incline, no levels were driven from it.

WASHINGTON.

SNOHOMISH COUNTY.

ECLIPSE.—A strike was made on this mine, on the Independent ledge, recently. Several men have been at work on the property for some time. The strike consists of a large pay streak of arsenical iron, carrying gold.

SILVER KING GOLD AND COPPER MINING COMPANY.—This company was organized recently near Silverton, with James Barron, Edward Marlton and Daniel Nelson as trustees. Capital stock, $1,000,000. The officers-elect are: President, Edward Marlton; vice-president, John L. Bowen; secretary and treasurer, E. F. Mundy.

WEST VIRGINIA.

The Governor has appointed Mr. James W. Paul chief inspector of mines, with John J. Absalom, S. A. Lewis, J. L. Preece and Jerry Meade as assistants. Under the law the Governor and chief inspector divide the State into four districts, and the chief inspector assigns one assistant to each district.

The coal and coke business in the Tucker County District is increasing materially, and 61 coke ovens have recently been fired up at Coketon.

The business of the Flat Top coal region is increasing also, and shipments for March show better than those of any preceding month this year.

FOREIGN MINING NEWS.

BRAZIL.

MANGANESE ORE.—United States Consul McDaniel, at Bahia, Brazil, reports to the State Department that a company recently formed has had an investigation made of certain mineral deposits near Bahia, with the result that manganese ores of rich quality and in great quantity have been found.

BRITISH COLUMBIA.

TRAIL CREEK COUNTY.

(From Our Special Correspondent.)

CALIFORNIA.—No work is at present being done on this property, but work will be resumed in another month.

COLUMBIA & KOOTENAY.—Mr. J. W. Astley, who has been appointed manager of this mine by Mr. Heinze, was formerly connected with the Montana Ore Purchasing Company. Mr. Astley says the shipments of ore will at once be increased. This mine has this year shipped 455 tons, and these figures have remained stationary for some time past, but the new management intends to make regular shipments hereafter.

NO. 1 MINING CLAIM.—The litigation over this claim, at Rossland, which has been pending for several years, is about to be settled, the case having been set for trial on April 20th at Nelson. The claim is owned by A. H. Sonnemann, of Brockton, Mass.; Peter Larson, of Helena, Mont., and Thomas L. Greenough, of Missoula, Mont. It is situated on the west end of the War Eagle claim and has a splendid showing of high-grade ore in its surface cuts. After a decision has been rendered it is hoped that the owners will combine and agree upon some plan by which this promising property can be worked.

INDIA.

MYSORE.

NUNDYDROOG GOLD MINING COMPANY.—The report for 1896 states that the gross income amounted to £168,881. The expenditure in India and England was £66,367, and the royalty on gold, payable to the Mysore government, amounted to £8,327. The profit on the year's working was £94,187, or £17,048 in excess of the previous year. The sum of £1,459 was brought forward, and the total disposable sum is £95,647. Interim dividends, each of 2s. per share, were paid on July 18th and on November 21st. The sum of £23,746 has been written off for income tax, depreciation, reserve fund, etc. The directors recommend a final dividend of 2s. 6d. per share, making a total distribution for the year of 32½%, as compared with 25% in 1895.

SOUTH AFRICA.

TRANSVAAL.

RAND CENTRAL ORE REDUCTION COMPANY.—This company, says the Johannesburg *Star*, has started up a water-jacket blast furnace for the recovery of gold from slags, sweepings, ashes, battery chips, etc., any material, in fact, which has come in contact with gold or gold-bearing ores during the process of winning the gold. With the exception of slags, this material has been hitherto neglected, save that here and there perhaps a little gold has been recovered from old battery iron. The starting of this plant is not generally yet known, but when it is the numerous companies now milling will doubtless find it to their advantage to dispose of their wastes to the Rand Central, and it is likely that a careful saving of this waste will be initiated everywhere where it is not now done. The company has been able to gather together about 250 tons to start on.

SPAIN.

MINERAL IMPORTS AND EXPORTS.—Imports of fuel into Spain in January were 119,267 metric tons of coal and 55,399 tons of coke. Imports of iron and steel included 74 tons of pig iron, 1,847 tons of wrought iron, 1,345 tons of steel and 39 tons of tinplates. Exports of minerals for the month were, in metric tons:

	1896.	1897.
Iron ore	470,754	605,385
Copper ore	43,623	48,096
Zinc ore	1,230	1,305
Lead ore	456	646
Salt	18,524	18,282

Exports of metals included 6,804 tons of pig iron, 1,185 tons of copper and 13,227 tons of lead.

TURKEY.

The Société des Mines d'Héraclée is the name of a company which has just been formed in Constantinople, with a capital of 10,000,000 fr. The company

has been formed for the purpose of working mines in the coal basin of Heraclia, and of constructing a harbor at Zoungouldagh, the concession for which was granted in 1892 to Yanco Bey Ioannides, and who has transferred his rights to Mr. Leonidas Zariti and M. Gaston Auboyneau, representing the Imperial Ottoman Bank and its group. The concession of the Société des Mines d'Héraclée is based on the following conditions: (1) The construction of a harbor at Kozlou (Heraclia), the concession of which will run for 42 years. (2) The right of working all unappropriated coal deposits which may be discovered in the course of the exploration for stone which will be required for the construction of the harbor. (3) An engagement from the Admiralty to lay down a railway line to connect Kozlou, Zoungouldagh and Tchataldjik. The company has acquired several mines, among them one from Messrs. Caramanian & Company, at Tchatal-Aghzi, which is the largest in the district and is connected by railway with the sea.

LATE NEWS.

Pennsylvania Bituminous Coal Production.—A preliminary report just issued by the Department of Internal Affairs puts the production of bituminous coal in Pennsylvania at 50,273,656 tons in 1896, against 51,813,112 tons in 1895, showing a decrease of 1,539,456 tons, or 3%. The number of men employed at the mines was 83,796 in 1896, against 84,904 in 1895. The average quantity of coal mined per man therefore decreased from 610 tons in 1895 to 600 tons in 1896. There were reported in the bituminous region last year 170 fatal and 398 non-fatal accidents; that is one person was killed to each 295,727 tons mined and one person injured to each 126,316 tons mined. As compared with 1895 there was an increase of 15 fatal accidents, but a decrease of 21 non-fatal accidents. The coke production for 1896 was 6 613,180 tons, a decrease of 2,309,149 tons, or 25.9% from 1895.

Montana Ore Purchasing Company.—This company has begun suit in the district court at Butte, Mont., to recover a large amount of damages for ore alleged to have been taken from the Rarus vein by the Boston & Montana Company. The suit is in part an offset to that recently brought by the Boston & Montana Company in the United States court at Butte. In the last-named litigation the court has refused to grant an injunction pending trial. The question at issue is an intricate one, involving questions of overlapping claims and extra-lateral rights. The Boston & Montana, it is said, relied on a previous decision of the court with regard to faults, but at the hearing at Helena the court held that this decision did not apply to the case at bar, because the faults are on the strike and not on the dip of the vein, and do not affect the Montana Ore Purchasing Company's right to follow the vein. In the Butte suit the plaintiff charges that a large quantity of ore has been taken from the Rarus vein in which it owns the mineral rights, though the Boston & Montana has title to a part of the surface. The Rarus and the Johnstown were overlapping claims, the former being the prior location. The title to the surface on either side of the Rarus was with the owners of the Johnstown, but it is claimed that the purchase of the Rarus carried with it the mineral rights to the entire length of the vein, irrespective of the surface ownership. The questions involved, as noted above, are very intricate and involve some points never before passed on. The Butte court has granted a temporary injunction, and has set the case for hearing on April 24th.

COAL TRADE REVIEW.

New York, Friday Evening, April 9

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending April 2d, 1897, compared with the corresponding period last year:

	1897. Week.	1897. Year.	1896. Year.
Pennsylvania Railroad.....	38,439	941,061	974,835

Production of Bituminous Coal in tons of 2,000 lbs. for week ending April 2d, and for years from January 1st, 1897 and 1896:

Shipped East and North:	1897. Week.	1897. Year.	1896. Year.
Allegheny, Pa.....	48 212	576,144	601,646
Barclay, Pa.....	‡161	9,126	.....
Beech Creek, Pa.....	§111,489	916,263	899,942
Broad Top, Pa.....	7,667	103,141	142,234
Clearfield, Pa.....	79,194	1,195,976	1,245,568
Cumberland, Md.....	70,944	851,312	1,405,700
Kanawha, W. Va	193,830	827,188	952,228
Phila. & Erie.....	773	142,354	13,108
Pocahontas Flat Top	†87,779	399,167	831,584
Totals.....	500,539	5,020,571	6,089,940

‡ For week ending March 21st.
† For week ending March 27th.
§ For week ending March 31st.

Shipped West:	1897. Week.	1897. Year.	1896. Year.
Monongahela, Pa.....	25,182	326,582	241,321
Pittsburg, Pa.....	32,859	478 129	491 418
Westmoreland, Pa.....	35,239	469,132	498,282
Totals.....	93,280	1,273,443	1,231 021
Grand totals.....	593,619	6,294,014	7,320,961

Production of coke on line of Pennsylvania Railroad for the week ending April 2d, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 80,257 tons; year, 1,127,743; to corresponding date in 1896, 1,256,641 tons.

Anthracite.

There is practically no change in the hard coal situation this week. There is a better movement of coal, and prices have become firmer, though that does not carry with it any insinuation that better rates have been realized. The non-appearance on April 1st of a circular of lower rates for spring business has brought some buyers into the market who had been holding off with the expectation that they were going to buy at lower prices. These, however, do not give orders for large amounts—not what they would have purchased at lower figures and what they really wanted to buy. Some of them are still hopeful that the move of the companies in Philadelphia, of announcing a 15c. reduction from circular prices on all sizes, will be followed by a similar action in New York. It is said this has had a tendency to make prices sag, though all of the sales agents report a stiffening in the figures instead of a decline. The upholding of prices and the restricted tonnage is the generally accepted policy of all the producers, and that policy is likely to govern for some time to come. Special grades of coal are selling at good prices. We note a recent sale of egg coal at $4.25 per ton, a figure which is 25c. above the circular. Other sales of the same size made earlier in the week were at $4.10 per ton. The small steam sizes are not at all abundant, and are bringing better prices than can usually be obtained. The report that some of the larger sizes have been broken up into the smaller steam sizes was probably an exceptional case, made necessary by the need of steam sizes to fill certain orders taken some time ago. On account of the depreciation in value in reducing to a small size, and the accompanying expense of the operation, this would not be done to meet the requirements of transient trade.

NOTES OF THE WEEK.

The statement of the Philadelphia & Reading companies for February and the three months of the fiscal year from December 1st to February 28th is as follows:

	Feb.	Three months.
Net earnings R. R. Company.....	$629,060	$2,063 680
Loss Coal and Iron Company.....	133,118	279,750
Income Reading Company.....	22,897	70,982
Total net.....	$518,839	$1,854 912
Estimated charges.....	775,000	2,325,000
Deficit.....	$256,161	$470,088

It will be seen that this statement is made in a new form, the gross earnings and working expenses being omitted. This has called out a great deal of unfavorable comment.

State Senator Gibson, of Pennsylvania, has offered a resolution to investigate the relations of the Lehigh & Wilkes-Barre Coal Company and the Central Railroad of New Jersey. The resolution was referred to the Committee on Corporations, and provides for the appointment of a special committee to inquire into the relations of the two companies and the reasons why the Central Railroad of New Jersey has defaulted upon the taxes now due to the Commonwealth of Pennsylvania.

Bituminous.

The seaboard soft coal market continues slow; the demand is not quite up to what it was and orders coming in for present delivery are small. This is a little different from what was expected a few weeks ago, when it was thought that trade would continue to increase from then out during the spring until it reached its usual proportions. Some people are claiming that winter stocks are still interfering with a freer demand for coal, but this has been the talk with them for some time, and it looks now as if it were merely a question of reduced consumption. The difficulty in securing some of the smaller sizes of anthracite has changed over some of the smaller consumers, in a few instances where they were prepared to use bituminous without change of their grates to soft coal.

The far East shows a lagging trade; in most instances the few orders from this territory in shippers' hands are limited down to the lowest ocean freight and quick despatch in shipment is asked on them. The consuming territory this side of Cape Cod is in a slightly better condition as regards its demand for coal, though not to any marked extent. New York harbor trade is quiet, as is also trade local to the lower shipping ports. All-rail trade seems to be in a better condition than the other parts of the market.

We note that the Chesapeake & Ohio canal is about to open for navigation, which will give another outlet to the trade, though there is some question of the freight rates via the canal being reduced to the point that will permit of competition with the all-rail rates to the shipping ports. There continues to be some discussion with some of the operators on the question of the reduction of rate to the miner, and there are one or two smaller mines reported as having reduced their rate 5c. In another case the operator is endeavoring to get his miners to work by the day. We also hear of one or two mines putting in coal-cutting machinery to reduce expenses.

Transportat on from mines to tide is fairly good, as is also car supply, except where special cars are required. In the coastwise vessel market things are in rather a peculiar condition. Whereas, the market seems weak and freights lowering, if anything, there seem to be but few vessels.

We quote current rates of freight from Philadelphia to Boston, Salem, Portland and Portsmouth, 65@70c.; Providence, New Bedford and the Sound, 60c.; Wareham, 75@80c.; Lynn, 80c.@$1; Newburyport, 80@85c.; Bath, 70c.; Gardiner and Bangor, 70@75c., with the usual towages to Gardiner. Five cents above these rates are quoted at the further lower ports.

NOTES OF THE WEEK.

Coal receipts at San Francisco by water in March were 106,111 tons. For the three months ending March 31st they were: Eastern, anthracite and Cumberland, 3,525 tons; Oregon and Washington, 14,392; British Columbia, 139,144; Australia, 35,743; Great Britain, 17,406; total, 348,210 tons, showing an increase of 3,600 tons, or 1·1% over the corresponding period in 1896.

Buffalo. April 8.

(From Our Special Corresponden t.)

No change for the better in the anthracite coal trade. The weather is thoroughly spring-like, and fuel is not wanted to any great extent for heating purposes. Prices are without change.

Bituminous coal is fairly active for manufacturing purposes, and the demand for lake vessels' use is commencing, as navigation is practically opened at this end of Lake Erie. The regular line propellers will not commence running, however, until about the 20th by mutual agreement. The first arrival of the season was the propeller *City of Buffalo*, from Cleveland, at noon on Wednesday, April 7th. Early to-day she started on her return trip.

News from the Straits of Mackinaw is to the effect that the ice may be dispersed at any time, as it is honey-combed and much broken up. Ports on Lakes Huron and Michigan as well as Ontario are open, and vessels are entering and clearing.

The new Buffalo Gas Campany will erect a plant capable of producing 3,000,000 cu. ft. per day. Work is to be commenced immediately.

Chicago. April .

(From Our Special Correspondent.)

Anthracite.—The buying of anthracite coal continues very moderate. The sales of coal during the week have been almost wholly in carload lots, and there are but few instances in which anything larger was observed. There is a great deal of hard coal on the docks of this city, and it is said that upward of 100,000 tons will be carried over at end of the season, April 30th. The selling price is below the circular rate.

Bituminous Coal.—Soft coal appears seemingly to gain slightly in sales from week to week, probably because industrial enterprises are becoming busier. The actual sales, though, are very much below the standard. There is a great supply of soft coal on cars about the city and it was never sold cheaper.

Pittsburg. April 8.

(From Our Special Correspondent.)

Coal.—There have been no shipments by water since our last; the supply in all the Southern and Western markets is sufficient to last for some time. From present indications the river mining situation is becoming shaky and uncertain, and the recent adjustment of rates was only temporary. The dissatisfaction now seems to be among the operators, at several mines, among them being the Black Diamond, Old Eagle and Mongah. The spring run of coal is well under way at the river mines. All the mines in the lower pools, which have been in operation in recent years, were started up, and if an amicable settlement can be reached, the spring run will be a very good one. There is a large number of empty coal boats in the pools. From the railroad district a good deal of coal is going to Cleveland and other points on Lake Erie, but the bulk of the output has to be credited to the large machine mining concerns, while the smaller pick mines are as yet getting but a very modest share of the trade. Prices continue low and competition is keen. A large contract for lake coal was closed by a local firm at Cleveland, the price being $1.55 per ton of ¾-in. coal f. o. wharf Cleveland; deducting 90c. for freight from Pittsburg to Cleveland, price at mine would be only 65c. at a 54c. mining rate. This shows that profits are extremely small and that the outlook for an increase in the mining rate is very slim.

The mines of the Youghiogheny Coal Company, at Scott Haven and Taylor station, have started up under an agreement to work during the year at a rate of 60c per ton. The diggers had been out on a strike against signing, but lost. The other mines of the company are expected to be in operation in a few weeks.

Connellsville Coke.—The trade took a discouraging turn last week. The estimated production was 108,897 tons, as compared with 107,258 tons the preceding week. Shipments also fell off, being for the week 265 cars less than the preceding one. The hesitating action of the iron markets is responsible for the slump in coke production. The unsettled condition of freight rates has affected the output of pig iron, which reacts on coke. The summary of the region for the week shows 11,041 ovens in blast, with 7,310 idle. There were no changes reported, and the list stands the same as last week. The Cambria Iron Company consumes all its own coke, and the starting of the plant will have no effect on the general market in any way. The running order of the 11,041 ovens in blast: 477 ovens made six

days; 5,919 ovens made five days, 297 ovens made four days, and 50 ovens, the Semet-Solvey plant, seven days, an average of 5·41 days, as against 5·36 days the week previous. The shipment of coke from the region for the week reached 6,238, a decrease of 291 cars. Shipments were distributed as follows: To Pittsburg, 2,540 cars; to points west, 2,670; to points east, 1,028. Total, 6,238 cars.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 9, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending Apr. 10, 1896.		Week ending Apr. 9, 1897.		From Jan., '96.	From Jan., '97.
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
Anthracite.	51	33,270	31	18,690	503,888	265,886
Coke.....	137	162,670	108	147,500	2,441,369	2,012,914
Charcoal...	19	5,360	18	5,550	75,560	80,636
Totals ...	207	201,300	157	171,650	3,020,817	2,359,436

The iron trade shows some increase in volume, but at extremely low prices. The range is shown by the fact that Bessemer pig has sold at $9.35 at Valley furnace and steel billets at $14.75 at Pittsburg mills. The demand for foundry iron continues light and low prices do not seem to bring out buyers.

The Lake ore men of the old ranges have completed their organization and have named $2.65 per ton for Norrie ore as a base price. Whether they can maintain their figures is uncertain, as it is known that Mesabi non-Bessemer ores are being offered at very low figures.

Export trade continues active, and heavy shipments of Alabama pig iron are being made from New Orleans. It is said that the total for the first quarter of the year will reach 50,000 tons. A Pittsburg concern has secured a contract for 7,000 tons of steel rails for the Danish State railroads.

Bids were received at the Navy Department on April 8th for armor plate for the three new battleships. This was the first letting under the new law, which limits the price to $300 per ton. The result was a failure, as only one bid was received and that was irregular in form, being simply a proposition from the Illinois Steel Company, of Chicago, to supply the 8,000 tons of armor desired at $260 per ton, on condition that it be given a 20-year contract to supply all of the naval armor. In such a case the remainder of the armor beyond the 8,000 tons would be supplied at $240 per ton. The armor was to be paid for in gold coin. The company also made a proposition to supply steel for an armor plant to be erected by the Department. Neither of these complied with the terms of the call.

NOTES OF THE WEEK.

The board of managers of the Joint Traffic Association has recommended a rate on iron and steel and manufactures thereof from the mills to the Canadian frontier of 12 cents per 100 lbs.

Reports are current that a plant for the manufacture of armor-plate and gun forgings is to be established at Newport News, Va., in connection with the shipbuilding yards there. It is said that Mr. C. P. Huntington and the Armstrongs of England are concerned. Mr. Huntington declines either to affirm or deny the truth of these rumors.

At a meeting in Chicago this week about 40 tinplate manufacturers were present, and an agreement was concluded. It is expressly stated that this is not a pool, but an informal understanding. It was decided to advance prices about 5c. per box, and the schedule was fixed as follows for large lots; Full weights, 108 lbs., $3.45; 100 lbs., $3.35; 95 lbs., $3.30; 90 lbs., $3.25; 85 lbs., $3.22½; 80 lbs., $3.20 per box.

New York. April 9.

The market remains quiet and prices continue low. Several contracts are pending for bridge and structural material. A temporary bridge will be built across Newtown Creek, between Brooklyn and Long Island City. Proposals for its construction will be received by the Joint Bridge Committee of the Board of Aldermen of the city of Brooklyn until April 22d.

An interesting feature in the cast-iron pipe trade this week is the awarding of the Boston contract to a Western concern, the Addyston Pipe and Steel Company, of Cincinnati, O., taking the contract of 3,300 tons at $16.75 per net ton. This is the lowest price on record. The Addyston works have bid on the Brooklyn contract of 1,650 tons of cast-iron pipe, their price being $18.48 per ton delivered, which is the lowest received so far.

The city of Newark, N. J., has just awarded a contract for about 1,050 tons of cast iron pipe to M. J. Drummond, a middleman. Buffalo is in the market for a quantity of 3-in. to 48-in. cast-iron pipe and special castings, and bids will be received until April 13th. The water works of Aberdeen, Md., recently awarded a contract for pipe and special castings to the Anniston (Ala.) Pipe Company.

Of sales for export this week we note a quantity of manufactured steel for South America, some light section steel rails and track material for Mexico, a quantity of mining machinery for Australia, and several sample lots of Southern pig iron for Switzerland and Sweden. Japan is in the market for about 12 carloads of wrought-iron pipe, and we understand local concerns are bidding on the contract in competition with British firms.

Pig Iron.—Buyers are few in number and small sales have been made this week. As regards prices, local representatives of furnace companies intimate that figures are being made to suit buyers. On the whole, prices have ruled rather low this week. There has been some shading in the price of the Northern brands, but the Southern grades of pig iron are apparently suffering the most from competition. It is said that some forge iron has been sold this week for shipment to a Western city on a basis of $5.85 at furnace. We learn that this price was given the purchaser in consideration of a prompt cash payment for the iron.

Quotations for Northern brands are now $12@$12.50 for No. 1, foundry; $11.25@$11.75 for No. 2 foundry; $10.50@$10.75 for No. 2 plain, and $10.25@$10.50 for gray forge. For Southern iron we quote: No. 1 foundry, $11@$11.25; No. 2 foundry, $10.25@$10.50; No. 3 foundry, $10@$10.25; No. 1 soft, $10.50@$10.75; No. 2 soft, $10.25@$10.50; forge, $9.75@$10.25; basic pig, $10.50@$10.75. All prices are for tidewater delivery.

Cast-Iron Pipe.—With the exception of a few contracts, to which we refer above, business this week has been light, and prices unsettled.

Spiegeleisen and Ferro-Manganese.—We hear of an order in the market for some 800 tons of ferro-manganese, but outside of this trade continues quiet, and prices remain unchanged, as follows: Ferro-manganese, 80% imported, $46.50@$47 per ton, delivered at buyer's mill. Spiegeleisen, 20%, $19@$19.50, same delivery.

Steel Billets and Rods.—Business locally continues quiet, while mill prices are unchanged at $15.50@$16 per ton for billets and $21.75@$22 per ton for rods.

Merchant Iron and Steel.—Trade continues light and prices are unchanged, and we quote: Common bars, 1·05@1·10c.; refined, 1·15@1·25c.; soft steel bars, 1·15@1·25c. Other quotations are: Steel hoops, 1·37½@1·40c., base; steel bands, 1·30@1·40c., base; steel axles, 1·60@1·75c.; links and pins, 1·60@1·70c.; tire steel, 1·70c.; spring steel, 1·95@2·15c.; light cotton ties, 50c. per bdl. at mill. All prices are for delivery on dock New York.

Plates.—Market conditions are unchanged with a tendency toward slightly better business. We quote for universal mill plates 1·20@1·20c. For steel plates prices are: Tank, 1·20@1·30c.; boiler shell, 1·30@1·35c.; flange, 1·40@1·50c.; firebox, 1·65@1·75c., according to quality. Charcoal iron plates are 2·25c. for shell; 2·75 for best flange and 3·25 for firebox. Some makers are asking 0·05c. higher for plates. Rivets are 3@3 25c. for iron and 1·80@2c. for steel. Prices are for tidewater delivery.

Structural Iron and Steel.—There have been a number of small orders taken, and prices remain unchanged. We quote for angles, 1·20@1·30c.; tees, 1·60@1·70c.; channels, 1·70@1·80c. The price of beams, New York delivery, is 1·70c. for ordinary sizes, 1·85c. for 20-in., and 1·95c. for 24-in., car lots. For small quantities 0·05@0·10c. higher is asked.

Steel Rails and Rail Fastenings.—Standard section steel rails are quoted at $20 at mill.

Quotations for rail fastenings are: Angle bars, 1·15@1·25c.; spikes, 1·60@1·65c.; bolts, 1·85@1·95c. for square nuts and 1·90@2c. for hexagon nuts.

Wrought-Iron Pipe.—Business continues unchanged, locally. However there are some inquiries for export. Discounts are as follows for plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10, 10 and 10%; 1¼ in. and under, 57, 10, 10, 10, 10 and 10%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10, 10 and 10%; 1¼ in. and under, 50, 10, 10, 10, 10 and 10%. For fair-sized orders these discounts are made with an additional 5 and 7%, according to quantity. Boiler tubes, 1 in. to 2¼ in., 70, 10 and 5%; 2½ in. up, 75 and 5%. Cold-drawn seamless steel tubes, 60%.

Nails.—Manufacturers of wire nails report a good demand with a large output from the mills. Quotations remain unchanged for carload lots and are $1.40@$1.45 per keg f. o. b. mill. From 5@10c. higher is asked for smaller quantities. The cut nail trade in the East is said to show more harmony, and prices rule as follows: New York, $1.40 per keg; Boston and New England, $1.42; Philadelphia, $1.38; Baltimore, $1.35.

Old Material.—The market is more active and prices hold steady. There have been some sales reported of old rails. For export it is said a lot of 750 tons of 56-lb. iron rails has been sold, but the price has not been ascertained. Quotations are: $10@$11.50 per ton for old steel rails, delivered at New York; $11@12.50 per ton for all sections of old iron rails, same delivery; $10.50@$11 per ton for No. 1 wrought yard scrap, delivered f. c. b. cars or to vessel at New York, and $12@$13 per ton for railroad scrap, delivered at buyer's mill.

Cast Scrap.—Business is very small in volume. A sale of 200 tons of cast scrap is reported at $9 per net ton. Quotations for good machinery scrap are $10@$11 per ton; ordinary cast scrap, $9; stove-plate and mixed, $7@$7.50. Old car wheels, $10.50@$11 per ton, delivered at buyer's works.

Buffalo. April 7.

(Special Report of Rogers, Brown & Co.)

Between any two dates three or four weeks apart an increase in the volume of business and a better tone is plainly discernible, but this increase is so slow that from week to week the change is hardly perceptible and business carries an aspect of dragging. Transactions continue to be small and always warmly contested. Prices, while not strong, cannot be said to be weak, and are more generally made at figures which shade some of our recent quotations and are made on the basis given below, which represent cash terms f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $11.50; No. 2 strong foundry coke iron, Lake Superior ore, $11; Ohio strong softener No. 1, $11 50; Ohio strong softener No. 2, $11; Jackson County silvery No. 1, $14; Southern soft No. 1, $11; Southern soft No. 2, $10.75; Niagara malleable, $11.25.

Chicago. April 7.

(From Our Special Correspondent.)

Pig Iron.—The demand for pig iron has not increased this week, sales having been confined almost wholly to carload lots. Inquiries were few. The buying of the week has been chiefly from Northern furnaces, Southern iron having had a quiet week. Prices have not depreciated as expected through the dissolution of the iron-ore pool, and remain unchanged. We quote: Lake Superior charcoal, $13.50@$14; Local Coke foundry No. 1, $11.25@$11.75; No. 2, $10.75@$11.25; No. 3, $10.50@$10.75; local Scotch foundry No. 1, $11.25@$11.75; No. 2, $10.75@$11.25; No. 3, $10.50@$10.75; Southern coke No. 1, $11@$11.25; No. 2, $10.25@$10.40; No. 3, $10@$10.15; Southern No. 1 soft, $10.65@$10 90; No. 2 soft, $10.15@$10.25; Jackson County silveries, $14@$16; Ohio silveries No. 1, $15@$15.50; No. 2, $14.50@$15; Ohio strong softeners, $12@$12.25; Alabama car wheel, $16@$16.50; coke, Bessemer, $13@13.50.

Bar Iron.—Trade has not been as good as the preceding week, only small sales having been noted. There are inquiries in the market for some good round lots, however. Car builders continue the chief purchasers. Common iron is quoted at 1·10@1·20c.

Steel Rails.—The selling of light rails for mining, logging and other industries continues well, a fair tonnage having been booked by the local works during the past week. Standard sections are only in limited demand, a few sales having been made to railroads. Rails are still quoted $21 with corresponding advance for lighter sections.

Billets and Rods.—There have been but few sales of billets in this market for weeks past. Rods have been in fairly good demand up to the past week, when sales dropped to almost nothing. Billets are quoted $17, and rods $22.50@$23.

Cleveland. April 7.

(From Our Special Correspondent.)

Iron Ore.—The movement of new ores appears nearly ready to start. In the mean time a few small sales of ore already on the docks of Lake Erie are being made at the prices prevailing last year. The first sales of 1897 ore are expected to be on the basis of $2.65 for Norrie ore. The indications are that some of the higher grades of ore will sell for $3 a ton, and the product of the Mesabi range will probably bring from $2.35 to $2.40. These figures have not been definitely decided on so far as high grade and Mesabi ores are concerned, but they seem to be firmly fixed in the minds of the members of the "old range" pool, which was organized last week. The business transacted during the last week was on the basis of the old scale of prices, which follow: Standard hard speculars, Bessemer quality, $4.50@$5; standard hematites, Bessemer quality, $4@$4.50; standard hematites, non-Bessemer quality, $3.50@$4; standard soft hematites, non-Bessemer quality, $2.50@$3 25.

No definite action has as yet been taken with reference to the lake freight rates for the season. The vessel owners seem to be willing to start on a basis of 75c. per ton from the head of the lake, as a basis, but they are waiting for the opening sales of ores.

Pig Iron.—The trade in pig iron has been small in this city during the past week, the demand being light. The prices of pig metal are now so low, it is said, that no further fall is probable during the season. The quotations are: Lake Superior charcoal, $13.50; Bessemer, $14.65; No. 1 foundry, $11.15; No. 2, $10.15; No. 1 Ohio Scotch, $11.15; No. 2, $10.65; Mahoning and Shenango Valley neutral mill irons, $9.75@$10; Mahoning and Shenango Valley red short mills, $9.75@$10.

Pittsburg. April 8.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business during the week developed no general activity, although recent improvement in certain lines of trade has been maintained. The Western furnaces which now produce such cheap iron, seem to have a slight advantage, but the real fact is that foundry iron produced in this State from Pennsylvania ores or from mixed ores differs from Bessemer pig iron made from the Western low phosphorus ores as widely as steel differs from wrought iron; and they are used for entirely different purposes. The competition from which Pennsylvania iron makers suffer more or less comes from the South, where foundry iron is made at exceedingly low cost. The disruption of the Lake Superior Ore Association should have—at least indirectly—a beneficial rather than deleterious effect upon producers of foundry iron all over the country by stimulating the machinery trade, which is always active when the steel business is flourishing, in fact, the beginning of the revival in the machinery business seems to be already in sight.

The same features of uncertainty and irregularity that have characterized the trade for some time past are shown. Consumers are largely influenced by the possible effect of the decision on railroads pooling and the uncertain elements of the iron-ore situation and are postponing orders in excess of immediate wants. In the local pig-iron market there is little change to note as compared with the condition of last week. Prices are irregular and uncertain.

Business in most departments remains dull; prices weak and lower. Reports from the Valley are unfavorable; two furnace companies have made assignments, said to be caused by failing to make collections. The strike at the puddling department of A. M. Byers & Company and Oliver's inaugurated on Tuesday came to an end on Wednesday, the members accepting a decline of 50c. a ton for puddling. A strike is pending at the National Tube plant at McKeesport because the company refused to discharge an objectionable workman.

Bessemer pig is $9.30@9.40, a further decline; mill iron, Pittsburg, $9@9.30 as per time of delivery; billets dull and lower; sales $15.20@15.35; other articles show no changes.

COKE, SMELTED, LAKE AND NATIVE ORE.

Tons.		Cash.
3,000	Bessemer, April, May, Valley	$9.60
1,000	Mill Iron, April, Pitts	9.10
1,000	Bessemer, April, May, June, Pitts.	10.40
1,000	Mill Iron, April, May, Pitts	9.10
1,000	Bessemer, April, May, June, Pitts.	10.20
500	Bessemer, April, Pitts.	10.30
500	Bessemer, April, Pitts.	10.15
500	Mill Iron, May, June, Pitts.	9.00
300	Bessemer, spot, Pitts.	10.15
200	No. 2 Foundry, special, Pitts.	11.25
100	No. 2 Foundry, Pitts.	10.40
100	No. 2 Foundry, special, Pitts.	11.25
50	No. 2 Foundry, Pitts	11.00
50	No. 2 Silvery, Pitts	12.00
50	No. 2 Foundry, Pitts.	11.00
25	No. 2 Foundry, Pitts	10.50
25	No. 2 Foundry, Pitts	10.50

CHARCOAL.

50	Cold Blast, Pitts.	$22.00
50	No. 1 Foundry, Pitts.	15.75
25	No. 2 Foundry, Pitts.	15.60
25	Cold Blast, Pitts	22 25

BLOOMS, BILLETS, SLABS.

12,000	Billets, April, May, June, Valley	15.00
1,500	Billets, April, May, June, Pitts.	15.30
1,200	Billets, April, May, Pitts.	15.20
750	Billets, April, Pitts	15.40
500	Billets, April, Pitts.	15.25
500	Billets, prompt, Pitts.	15.35

MUCK BAR.

1,000	Neutral, April, May, Pitts.	19.00

STEEL WIRE RODS.

500	5-gauge, Pitts	$20.50

OLD RAILS AND SCRAP.

1,000	Steel rails, gross, Pitts.	10.25
1,000	Steel rails, gross, Pitts.	10.00
200	No. 1 Wrought Scrap, net, Pitts.	10.00
200	Cast borings, gross, Pitts.	6.50
150	Wrought turnings, net, Pitts.	6.75

SHEET BARS.

1,000	Delivered, Pitts.	$18.50

SKELP IRON.

700	Wide grooved, Pitts.	$1.15 4 m.
600	Narrow grooved, Pitts.	1.15 4 m.
500	Sheared, Pitts	1.27½ 4 m.

SKELP STEEL.

750	Wide groov'd, Pitts.	$1.00 4 m.
600	Shear'd, Pitts.	1.10 4 m.
500	Wide grooved, Pitts.	1.00 4 m.

METAL MARKET.

NEW YORK, Friday Evening, April 9, 1897.

Gold and Silver.

Prices of Silver per Ounce Troy.

April.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.	April.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.
3	4.87⅛	28⅜	61⅞	.479	7	4.87	28⅜	61¾	.478
5	4.87	28⅜	61¾	.478	8	4.87	28⅜	61¾	.478
6	4.87	28 5/16	61¾	.478	9	4.87	28⅜	61⅝	.478

Silver under light demand from India has shown signs of weakness, but has not yielded below 28⅜d., actual business, a large continental order absorbing all the current supplies at this figure. The market closes firm, with but little offering.

The United States Assay Office in New York reports the total receipts of silver at 76,090 oz. for the week.

Gold and Silver Exports and Imports, New York

For the week ending April 9th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

	Gold.		Silver.		Total Excess, Exp. or Imp.	
	Exports.	Imports.	Exports.	Imports.		
We'k	$2,000	$19,883	$839,160	$39,579	E.	$781,638
1897..	1,65..911	1,089,062	11,038,643	538,214	E.	10,419,278
1896..	11,276,793	16,721,672	11,307,577	534,659	E.	5,328,039
1895..	29,842,312	13,472,849	8,492,875	382,231	E.	24,480,113
1894..	10,635,265	3,898,629	11,865,192	472,219	E.	18,129,609

The gold exported for the week went to the West Indies, and the silver to London. The gold and silver imported came chiefly from Central and South America.

Gold and Silver Exports and Imports

At all United States ports, February, 1897, and years from January 1st, 1897 and 1896:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.	
	Exports.	Imports.	Exports.	Imports.		
GOLD						
Feb..	$336,697	$514,700	$16,459	$282,468	I.	$471,021
1897..	708,641	1,601,321	86,861	491,523	I.	797,342
1896..	12,750,226	21,927,029	12,003	279,020	I.	9,443,820
SILV.						
Feb.	4,660,362	762,942	66,158	1,568,369	E.	2,395,209
1897..	8,658,116	1,640,009	223,061	3,443,519	E.	3,797,649
1896..	10,275,618	2,463,564	123,515	2,822,560	E.	5,107,019

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.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Month.	1897.		1896.		1895.	
	London. Pence.	New York. Cents.	London. Pence.	New York. Cents.	London. Pence.	New York. Cents.
January	29·74	64 79	30 69	67·13	27·36	59·69
February..	29·68	64·67	31·01	67·67	27·47	59·90
March	28·96	63·06	31·34	68·40	28·33	61·98
April			31·10	67·92	30·39	66·61
May			31·08	67·88	30·61	66·75
June			31·46	68·69	30·47	66·64
July			31·45	68·75	30·48	66·75
August			30·93	67·34	30·40	66·61
September			30·19	65·68	30·54	66·90
October			29·68	65·05	30·89	67·64
November			29·46	64 98	30·79	67·42
December.			29·70	65·24	30·40	66 47
Year			30·67	67·05	29·53	65·28

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.

Not much change in the business situation is to be reported for the week. The uncertainty as to the tariff continues to be a factor of importance, and aids in checking any disposition toward expansion in trade. Exports of merchandise continue large, though shipments of grain have fallen off considerably Money continues in over-abundant supply at the commercial centers, and the chief activity has been in the importation of goods on which duties will be increased by the new law.

The chief event worthy of note abroad is the action of the Bank of England in reducing the official discount rate from 3% to 2½%. The rate is now nearly back to the lowest point, from which it was raised last fall to check the outflow of gold.

The Treasury Department gives the following statement of the money in the United States on April 1st:

Kind.	In circulation.	In Treasury.	Totals.
Gold coin	$517,125,757	$151,988,509	$369 114,266
St'd silver dollars	54,507,319	393,211,322	447,718,641
Subsidiary silver.	60,246,494	15 974,428	76,220,921
Gold certificates..	37,456,339	1,483,350	38,939,689
Silver certificates.	361,026,153	12,535,351	376,561,504
Treas. notes 1890..	90,244,810	26,886,470	117,131.280
U. S. notes.	348,513,640	98,167,376	546.681,016
Currency certif...	74,460,000	610,000	75,070,000
Nat. bank notes...	222,420,183	11,374,958	233,795,141
Totals	$1,659,000,694	$712,231,764	$2,381,232,458

The total amount in circulation shows a decrease of $6,694 259 as compared with March 1st, but an increase of $140,537,231 as compared with April 1st, 1896. The estimated amount in circulation April 1st was $23 01 per capita.

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:

	Gold.	Silver.	Total.
Asso. Banks of New York			$85,988,200
1896			59,251,600
Bank of England	$191,983,020		191,983.020
1896	234,390,780		234,390,780
Bank of France	383,339,900	$244,728,300	628,068,200
1896	389,602,801	248,960,069	638,562,870
Imp. Bank of Germany			215,240,000
1896			219,920.000
Austro-Hungarian Bank	155,920,000	63,095,000	219,015,000
1896	131,150,000	63,832,000	194,982,000
Netherlands Bank	13,158,000	34,105,000	47,263,000
1896	13,116,000	34,605,000	47,721,000
Belgian National Bank			21,734,000
1896			19,929,000
Bank of Spain	42,642,000	53,987,000	96,629,000
1896	40,022,000	51,924,000	91,946,000
Bank of Italy	61,845,000	11,725,000	73,570,000
1896	60,015,000	10,305,000	70,320,000
Imp. Bank of Russia	549,950,000		549,950,000
1896	497,650,000		497,650,000

The return for the Associated Banks of New York is of date April 3d; all the others are of April 8th, except the Bank of Italy, February 28th, and the Bank of Russia, March 1st-13th.

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.

The statement of the United States Treasury on Thursday, April 8th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	April 1.	April 8.	Changes.	
Gold	$151,786,464	$152,705,355	I.	$918,891
Silver	19 916,350	19,903,799	D.	12,551
Legal tenders	23,707,376	26,288,144	I.	2,580,768
Treasury notes, etc..	26,886,470	25,499 658	D.	1,386,812
Totals	$222,296,660	$224,396,956	I.	$2,100,296

Treasury deposits with national banks amounted to $16,905,835, an increase of $282,439 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending April 3d, gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	$480,438,300	$465,221,900	$502,732,700
Deposits	500,822,300	481,795,700	569,226,500
Circulation	13,084,000	14,254,300	15,701,800
Reserve:			
Specie	61,471,200	59 251,600	85,988,500
Legal tenders	74,664,300	78,203,300	103,984,900
Total reserve	$139,135,500	$137,454,900	$189.973 200
Legal requirement	125,204,560	120,448,925	142,306,625
Surplus reserve	$13,930,940	$17,005,975	$47,666,575

Changes for the week this year were decreases of $1,745,500 in loans and discounts, $2,496,500 in deposits, $125,000 in circulation, $8,600 in specie, $1,844,700 in legal tenders, and $1,219,175 in surplus reserve.

Shipments of silver from London to the East for the year up to March 25th are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes.	
India	£1,215,298	£1,030,300	D.	£181,998
China	311,950	44,512	D.	267,438
The Straits	116,882	46 793	D.	70,089
Totals	£1,644,130	£1,121,605	D.	£522,525

Arrivals for the week this year were £203,000 in bar silver from New York and £40,000 from Chile, a total of £243,000. Shipments for the week were £42,800 in bar silver to Bombay, and £5,600 in Mexican dollars to Penang, a total of £48,400.

Indian Exchange has been firmer, partly on account of large remittances of famine funds, and all the Council bills offered in London were taken at an average of 15·09d. per rupee. The low price of silver has interfered somewhat with exchange, some remittances being made in silver.

The imports of specie from Mexico at San Francisco, principally by rail, for the quarter ending March 31st, compare as follows:

	1896.	1897.
Silver dollars	$3,664,019	$1,265,368
Silver bullion	270,115	186,486
Gold bullion	163,117	158,864
Total	$3,497,251	$1,610,718

For the same quarter in 1895 the total was $924,027. The large decrease this year shows a diminished demand in China and Japan for Mexican dollars.

Prices of Foreign Coins.

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

	Bid.	Asked
Mexican dollars	$ .48¼	$ .49¼
Peruvian soles and Chilean pesos	.44	.46
Victoria sovereigns	4.86	4.90
Twenty francs	3.86	3.90
Twenty marks	4.74	4.80
Spanish 25 pesetas	4.78	4.85

Other Metals.

Copper.—The market has been rather dull during the week, and even flat, and prices have again eased off somewhat. Early in the week some second-hand Lake copper sold at 11·70c. and afterwards at 11⅝c., but later on not more than 11·50c. was bid. The large companies, however, do not yet sell at the latter price, though it appears that negotiations are being carried on for shipment after the opening of navigation, which will probably be towards the end of this month. Electrolytic copper has been selling at rather lower prices, and fair quantities have changed hands; cakes, wirebars and ingots at 10·80@10·90c. and cathodes at 10·55@ 10·65c. Casting copper is offered only in retail lots at 10¾@10⅞c. Manufacturers still complain of not receiving any new orders, but it appears that their stocks of raw material have been greatly reduced, and they will probably not be able to stay out of the market very much longer.

The foreign market has remained dull, and only a moderate business has been doing. Nevertheless the speculative sorts are slightly higher than they

were last week. The week opened with g. m. b.'s selling at £48 15s., but at the close £49 5s.@$49 7s. 6d. for spot and £49 10s.@£49 12s. 6d. for three months prompt is recorded. Refined sorts are reported to have changed hands abroad at rather low figures, and we quote: English tough, £52@£52 10s.; best selected, £52@£53; strong sheets, £60; India sheets, £57; yellow metal, 4⅛d.

Tin has been rather quiet, and some heavy arrivals which came in during the week are pressing on the market; thus the advance established during the week in London has been fully followed up over here. We have to quote Straits or Malacca for spot and April 13·35c. and May to August 13 30c.

The market in London ruled firm, with fair transactions, opening at £59 10s. for spot and closing at £60 5s.@£60 7s. 6d. for spot and £60 15s.@£60 17s. 6d. for three months prompt.

Lead has been very quiet and prices are again somewhat lower. Consumers have done very little, and inducements would have to be offered them to take in larger supplies. Only a limited business has been done at 3⅜c. The markets in the West are also quiet, with transactions in St. Louis at 3·15c.

European prices are considerably higher, and Spanish lead is quoted £11 16s. 3d.@£11 18s. 9d. and English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is rather easier, with the latest sales at 3·15c. for soft Missouri and chemical, and 3·17½@3·20c. for argentiferous. Consumers appear to be pretty well supplied, and there are not many who care to anticipate their wants at present for future requirements.

Spelter has held its own in spite of the rather light demand, and is firmly held at 4⅛@4·15c.

The foreign market shows little change, and good ordinary brands are quoted £17 6s. 3d, and specials 2s. 6d. higher.

The Nevada, Mo., smelter of the Cherokee Lanyon Company on April 3d shipped 400 tons of spelter direct to Liverpool, England. This is one of the largest single shipments ever made from the United States; it will relieve the ore market at Joplin, and will have a tendency to keep up the price of zinc ores.

Antimony is unchanged; Cookson's 7½c., U. S. Star 7¼c., and Hallett's 7c.

Nickel.—Business continues quiet, and no change in prices can be reported We quote for ton lots 33½@36c. per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size of order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are firm at $14@$15 per oz., New York. The London quotation is 55s.@56s. 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, 54c., 55c. and 56c. per gram. Wire and foil are 52c., 53c. and 54c. per gram.

Quicksilver.—The New York quotation is unchanged at $39.75 per flask. The London price is £7 5s. per flask, with £7 4s. named from second hands.

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

Aluminum:	
No. 1, 98% pure ingots for re-melting, per lb	37@42c.
No. 2, 94% pure, " " "	31@34c.
Ingots from scrap, per lb	30c.
Rolled sheets, per lb	46c. up.
Aluminum-nickel casting metal, per lb	35@40c.
Bismuth, per lb	$1.30@$1.80
Phosphorus, per lb	50@55c.
Platinum, per oz	$14.50@$15.50
Tungsten, pure powder, per lb	70c.
Tungstic acid, per lb	45c.
Ferro-tungsten, 60% in ton lots, per lb	60c.

Variations in price depend chiefly upon the size of the orders.

Imports and Exports of Metals.

Baltimore.**	Week, April 8. Exp.	Imp.	Year, 1897. Exp.	Imp.
Bismuth metal, cases				
Chrome ore, long tons				
Copper, fine " "	692		10,467	
" matte " "				
" sulphate " "	39		1,332	
Iron ore " "		5,265		69,219
" pigs, bars,				
ingots, blooms, " "			80	858
Iron oxide, bags				
" pyrites, long tons				
Ferro-manganese " "	39		1,314	
Ferro-silicon " "		25		48
Lead " "	100	300	120	300
Limestone, short "				
Manganese metal, long "			89	2,860
Spiegeleisen " "				480
Steel " "	200		1,254	197
Steel wire, bundles	44	321	327	5,139
Tin, long tons	121		366	1,275
Tin and black plates, boxes				10,425
Zinc (spelter) long tons			2	

**From our special correspondent.

New York.*	Week, April 1. Expts.	Impts.	Year, 1897. Expts.	Impts.
Aluminum, boxes				
Antimony ore, short tons		21		249
" regulus, casks				
Brass, old, short tons	22		193	95
Copper, fine, long tons	†1,460	77	17,266	1,068
" matte " "	†152		3,320	111
" ore " "				
" sulphate " "	54		3,635	
Iron ore				
" pigs, bars, rods, etc. " "	428		3,035	1,419
Iron pyrites " "				
" sulphate " "				
Ferro-mangan'se " "				
Ferro-silicon " "				
Manganese ore " "		5		2,117
Spiegeleisen " "				
Lead bullion " "		†2,543		12,758
" pigs and bars " "				
Magnol'a metal " "				
Nickel " "				
St'l, bil'ts, rods, etc. " "	1,535	151	8,391	6,182
Tin " "	†55	665	598	3,827
Tin dross " "				
Tin and black plates, boxes		40,829		198,928
Zinc dross, long tons				
Zinc (spelter), long tons		†25	1,585	869

*Metal Exchange Reports. † Week ending April 8th.

Philadelphia.††	Imports. Week, April 2.	Year, 1897.
Antimony, casks		2,700
Copper ore, long tons	2,119	8,882
Ferro-manganese, long tons		48
Ferro-silicon		
Iron ore, long tons	10,944	64,786
" pig " "		
" pyrites, long tons		
" and steel scrap, long tons		
Manganese ore, long tons	2,850	12,250
Spiegeleisen " "		
Tin " " "	100	225
Tin and black plates, boxes		3,961

†† From New York Metal Exchange Reports.

Average Monthly Prices of Metals

In New York, for the years 1897 and 1896; in cents per pound.

Month.	Copper. 1897.	1896.	Tin. 1897.	1896.	Lead. 1897.	1896.	Spelter. 1897.	1896.
Jan.	11·75	9·87	13·44	13 02	3·01	3 08	3·91	3 75
Feb.	11·92	10·64	13·59	13 44	3·28	3·19	4·12	4·03
March	11·80	11·03	13 43	13·30	3·41	3·14	4·12	4 20
April		10·98		13·34		3·07		4 07
May		11·15		13 51		3·03		3·98
June		11 67		13·59		3·03		4 10
July		11·40		13·63		2 96		3·97
August		10 98		13 49		2·73		3 76
Sept.		10 66		13·15		2·77		3·60
October		10 66		12·94		2 80		3·72
Nov.		11·23		13 09		2·96		3 93
Dec.		11·28		12·96		3 04		4·14
Year		10·88		13·29		2·98		3·94

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, April 9.

Heavy Chemicals.—Matters are still very much unsettled, because importers are obliged to attach a special clause to all contracts on chemicals affected by the new tariff bill, calling for an additional amount equal to the duty on the goods purchased. Buyers do not care to do business in that way, and in addition are holding off because they believe the Senate will greatly modify the rates that have been proposed. Chlorate of potash continues firm at slightly lower prices, with not much business doing.

We quote: Caustic soda, 60%, $2.10@$2.15; 70, 74@76%, $1.90@$2 per 100 lbs. Alkali, 58%, 65c. for 50-ton lots and over, and 70@80c. for smaller quantities; 48%, $1@$1.20 for jobbing lots. Caustic soda ash, 48°, $1.50@$1.70. Bleaching powder, prime brands, $1.75@$1.87½; Continental, $1.57½@$1.70 per 100 lbs. Continental F brand, $1.60@$1.65. Bicarb. soda, English, 1·75c. per lb.; American, bulk, $1.50@$3.50 per 100 lbs., according to make. Sal-soda, English, 60@65c.; American, 55@65c. (in barrels), 80c. (in kegs) per 100 lbs. Hyposulphite of soda, 1·60@1·80c. in casks; 1·70@1·95c. in kegs. Chlorate of potash, 10@11c.

Acids.—Business has been fairly good during the past week, but the market is without special feature. An effort is on foot to advance the price of salt, which, as the basis of hydrochloric acid, will affect the price of this article. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid, commercial No. 8 (in barrels), $1.40@$1.50; in carboys, $1.50@$1 65; redistilled, 28%, in bbls., $1.70@$1.80; in carboys, $1.90@$2.05; muriatic acid, 18°, 75@85c.; 20°, 85@95c.; 22°, $1.15@$1.25, according to make and quantity. Nitric acid, 36°, $3.50@$4; 40°, $4@$4.50; 42°, $4.50@$5.50. Oxalic acid, $8 ex-dock and $8.25 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 85c.@$1 in carload lots, 10@15c. higher for small quantities. Chamber acid, $6@$6.50 per ton at factory. Blue vitriol, $4.25@$4.50, according to grade and order.

Brimstone.—There has been no change in demand or prices since last week, conditions remaining very quiet. Best unmixed seconds are quoted at $20 per ton on spot, $19.50@$19.75 to arrive, and $19.50 for shipment. Thirds are $18.75 per ton for shipment.

Fertilizing Chemicals.—There is nothing new to report, the trade continuing quiet as before. The buying has been light, but as the killing has been light also, there has been no accumulation of stocks.

Sulphate of ammonia, gas liquor, $2.25 for shipment, and $2.30 for spot; bone, $2.15@$2.20 per 100 lbs. Dried blood, high grade Western, $1.70 per unit New York; f. o. b. Chicago, $1.45 per unit; low grade, fine ground, Western, $1.47½@$1.50 f. o. b. Chicago. Azotine, $1.70@$1.75 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13%@15%, av. P_2O_5, 54@65c. per unit at sellers' works in bulk. Dissolved bone black, 17%@18% P_2O_5, 85c. per unit. Acidulated fish scrap, $10, and dried scrap $19.50@$20, f. o. b. fish factory. Tankage, high grade, $13.75@$14 per ton; concentrated, $1.35 per unit, f. o. b. Chicago; New York, $19@$20; low grade, $18@$19. Bone tankage, $19@$20; ground bone, $21@$23. Bonemeal, $20@$22 50.

Sulphate of Potash: 90%, New York and Boston, $1.99½; Philadelphia, Baltimore and Norfolk, $2.01; Southern ports, $2.03.

Double Manure-Salt: 1·03c., basis of 48% chlorate high grade (basis 90%), 2·01½@2·05c.; in bulk, 24@36% per unit O. P., 38½@40c.

Muriate of Potash: We quote: 1·78c. at New York and Boston, 1·79½c. Philadelphia, Baltimore and Norfolk, and 1·84½c. Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12·4% actual potash, equivalent to 23% sulphate of potash, $8.58. Actual weights, ex-vessel at port of New York per ton of 2,240 lbs. (testing as before), $8.83.

Nitrate of Soda.—The market is firmer again, and prices have advanced somewhat, small lots having been sold at 1·97½c. For spot sales 1·95c. is asked; to arrive, near by, 1·85@1·90c., and for shipment, 1·80c.

NOTES OF THE WEEK.

The total shipments of phosphate rock through the port of Punta Gorda, Fla., during 1896 were 45,496 tons. In January, 1897, shipments were 8,452 tons, in February 3,152 tons and in March 7,784 tons. The shipper of the entire amount is the Peace River Phosphate Mining Company.

At the annual meeting of the United Alkali Company in London, England, March 19th, the report stated that the certified balance sheet and profit and loss account on the working of the 12 months ending December 31st showed a net profit of £288,070. A dividend was recommended on preference shares at 7s. per share, and a dividend on ordinary shares at 4s. per share. This provided an amount to be placed on the reserve fund (making the total reserve £707,781, of which £600,000 formed the depreciation portion of the fund) of £40,956. The president, in the course of his annual statement, said that the affairs of the company at present looked promising and satisfactory. On the last occasion on which he presided, their affairs were not in so satisfactory a state as he was glad to say they now appeared, a great improvement having been secured in 1896.

Messrs. Mortimer & Wisner, the well-known brokers of this city, send us the following statement of nitrate of soda, issued under date of April 1st, 1897:

	1897. Bags.	1896. Bags.	1895. Bags.
Imported into Atlantic ports from West Coast S. A., from Jan. 1, 1897, to date	131,958	239,280	219,145
Stock in store and afloat April 1, 1897, in New York	115,778	84,319	71,177
Boston	5,000		9,000
Philadelphia		182	600
Baltimore	7,000	3,000	7,000
Norfolk, Va		581	1,000
Charleston			2,500
To arrive, due July 15, 1897	119,000	262,000	207,000
Vis. supply to July 15, 1897	246,778	394,531	298,277
Stock on hand Jan. 1, 1897	123,593	53,839	58,367
Deliveries past month	45,780	81,290	82,603
Deliv. since Jan. 1 to date	127,773	205,588	186,235
Total yearly deliveries		746,264	828,042
Prices current April 1	1.92½@1.95	1.67½	1.60

The Berlin Iron Bridge Company, of East Berlin, Conn., has the contract for furnishing the steel roof for a large storehouse which is to be erected by the Waterbury Manufacturing Company, Waterbury, Conn. This building is 54 ft. wide and 144 ft. long. The side walls are of brick. The roof will be supported by steel trusses. The covering is to be corrugated iron lined with the Berlin Company's patent anti-condensation fireproof roof lining.

Liverpool. March 30.

(Special Report of Joseph P. Brunner & Co.)

The recent excitement in the chemical market has pretty well subsided, and although there is no activity, a fair amount of business is passing in a quiet way.

Soda ash is in moderate request, and the late advance is firmly maintained.

Quotations still vary considerably according to export market, and nearest range for tierces may be called about as follows: Leblanc ash, 48%, £4 10s. @£4 15s.per ton; 58%, £4 15s.@£5 per ton, net cash. Ammonia ash, 48%, £3 5s.@£4 per ton; 58%, £3 10s @ £4 5s. per ton, net cash. Bags 5s. per ton under tierces. Special terms are made for American business.

Soda crystals are steady at £2 17s. 6d. per ton less 5% for barrels and 7s. less for bags. Special quotations are given for American orders.

Caustic soda is in moderate supply and inclined to stiffen. We quote spot range, as to market, about as follows: 60%, £6 3s. 9d.@£6 5s. per ton; 70%, £7 3s. 9d.@£7 5s. per ton net cash; 74%, £8 2s. 6d.@£8 5s. per ton; 76%, £8 15s.@£9 5s. per ton, net cash.

Bleaching powder is without special feature and quoted at from £6 15s.@£7 per ton, net cash, for hardwood packages, as to destination.

Chlorate of Potash.—The recent demand has been filled, and although makers still quote 5¼d. for April delivery, resale parcels are offering at 4½d.@ 4¾d. per lb., while buyers hold aloof.

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

Sulphate of ammonia continues dull, at about £8 5s.@£8 7s. 6d. per ton, less 2½% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is inactive, at about £8 5s.@£8 7s. 6d. per ton, less 2½% for double bags f. o. b. here, according to quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., less 2½%.

Valparaiso, Chile. Feb. 27.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—Reported sales during the fortnight sum up to 327,000 quintals, and about 200,000 quintals have been sold under private terms. European quotations show a further decline both for season's nitrate and for present shipments, the latter quoted at 7s. 0½d. cost and freight. Producers show signs of giving way in their pretensions, refined nitrate being offered at 5s. 10d. for August and December and 95% at 5s. 8½d. alongside monthly, March and December. We quote 95% March and April delivery at 5s. 7d.; refined, 5s. 9½d. nominal. The price of 5s. 7d. with 17s. all round freight stands in 7s. 0¾d. per cwt. net cost and freight without purchasing commission.

MINING STOCKS.

Complete quotations will be found on pages 370 and 371 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.	Denver, Colo.	British Columbia.

New York, Friday Evening, April 9.

Trading in mining stocks this week has been light. The Comstocks are still sagging in price and but three stocks have been dealt in. Belcher sold at 44c., assessment (25c.) on. Yellow Jacket changed hands at 30c. and Mexican at 25c. Sales were light.

Two California stocks only were quoted this week. Standard Consolidated advanced to $1.70, while Brunswick Consolidated rose from 7c. at the opening to 9c. at the close to-day. The clean-up from the old workings of the Standard Consolidated Mining Company last month netted about $4,000; nothing has yet been secured from the acquired properties.

The Cripple Creek stocks were quiet this week and ruled lower in price, Portland receding to 69c., and Anaconda to 43c. Of the other Colorado stocks Breece advanced 5c. from the opening last week and sold 200 shares at 20c. Japan dropped from $3 on March 29th to $1.50 on April 3d, but advanced again to $3.25 on April 8th. Senator Mining and Milling Company advanced to $1.40¾ for the common stock, and $8 25 for the preferred, with transactions reported in both shares.

The Montana stock, Alice, advanced to 55c., exdividend. The last time the stock was dealt in it brought 40c., dividend (5c.) on. Russell, the gold stock of North Carolina, was lower in price this week, selling between 26c. and 32c. There were heavy dealings in the Colombian Gold Mining Company of the Republic of Colombia at 41@50c., an advance of 12½c. since the close of last week.

At the New York Mining Exchange the total transactions for the week were less than for the preceding one. Two new members have been admitted on this exchange, James F. Matthews and John Howley, of New York. Several mining companies are said to have made application for listing on this board.

Boston. April 8.

(From Our Special Correspondent.)

The general course of the market shows improvement this week, prices getting back again nearly to where they stood 10 days ago. This is the natural reaction after too sharp a decline and not influenced by any movement in copper, which still rules very quiet. Arnold went off $¼ to $2½, and rallied to $2⅝, with very little doing. Atlantic advanced from $20 to $21. Calumet & Hecla has stood at $370 all the week, with very moderate transactions, the total footing up only 14 shares. Centennial has ruled very even, with a range upward from $7¼ to $7¾, and closes $7½. Franklin is $¼ better, with a single sale at $11. Kearsarge, after declining from $16⅝ to $15 last week, has rallied to $16¼. Osceola, which touched its low point for the year, $28¾, April 1st, has since rallied to $30½, with a fairly good demand. Quincy, down to $104 last week, has advanced to $110. Tamarack gained from $117 to $120, and closed at that figure. Tamarack, Jr., shows small sales at $17. Wolverine touched $8¾ April 2d, and later advanced to $9¼.

Boston & Montana, which sold at $119 April 1st, has since steadily improved until it reached $126⅜ to day. The buying demand seems to have set in again. Butte & Boston rallied from $15¼ to $17⅝. There seems to be a strong disposition to advance this stock. Old Dominion gained from $13¾ to $14½, with a better demand than recently.

Gold stocks present no new features. Gold Coin has ranged between $5⅝ and $5⅛, closing at the latter. Merced is still lower, dropping from $9 to $8½ and no business transacted on half the days of the week. Pioneer was boomed a little on newspaper reports of something good to come, gaining from $5 to 5¾ and back again to $5¼. Santa Ysabel is very much neglected, not a sale for the week.

In the afternoon the market was fairly sustained with less vigor in the movement generally. Boston & Montana came out more freely and went off to $125, rallying later to $126. Butte & Boston receded to 16¾ and rallied later to $17¼; Centennial was a fraction higher at $7½ with sales of 550 shares.

Cleveland. April 7.

(From Our Special Correspondent.)

The only feature of interest in connection with the iron mining stock market in this city during the past week is the fact that Pittsburg & Lake Angeline has strengthened considerably during the last few days. Last week it was held at $70, but this week none of the stock of that company is offered for sale, and $70 is bid for it. There is no change in the quotations of the other stocks handled in this city.

Salt Lake City. April 3.

(Special Report of James A. Pollock.)

The mining stock market was fairly active this week, and was much larger in value than during the previous same period. The silver stocks continue to lack support and show declines from 1 to 5%. The gold stocks are strong and are showing the highest range of prices for this year. Although no very heavy business was done in the stock, Ajax remained practically stationary. Anchor did nothing. A still further decline occurred in Bullion-Beck. Buckeye was not especially active, and quotations changed little. Bogan has about gone out of the local market. With very little of the stock offered, Centennial continues far down. Dalton was somewhat weaker.

Dalton & Lark was very materially shaded. Light operations have been resumed at the properties. Daly displayed very little activity, and prices showed no advance. Daly West was slightly lower, probably through sympathy. Dexter was again in good demand and sold at advancing figures. A slight shading of Galena was followed by considerable business in the stock. Geyser-Marion stock continued firm. Little Pittsburg was active but stationary. Mercur continued to advance, and at the close was not offered much under $7.50. Mammoth again sold lower. Mercur Gold Dust is looking extremely well. Northern Light sold several points lower, but was eagerly taken on all recessions. Lower prices were again recorded by Ontario. Rover did some business at the old figures. Silver King did only a light business and at last week's figures Sacramento did practically nothing, except that another of the heavy holders parted with his stock. Swansea was sold down somewhat and was showing only fair strength at the close. South Swansea was also lower, but did considerable business. Sunshine did more business at the low figures, but buyers were numerous whenever cheap stock was offered.

San Francisco. April 3.

(From Our Special Correspondent.)

The market opened on Monday with stocks in a very unpromising condition. Quotations were low on small transactions, with very little interest shown and no disposition to sustain prices in any direction. A little attempt was made to stir up discussion on the weekly reports, but without success.

On Tuesday there was a revival of activity and some buying, which brought prices up to a little higher level. Later there was less business, but prices continued quite firm. The dealings were small in amount and hardly any large transactions were noted.

Toward the end of the week the market lapsed into dullness and closes quiet and weak, with little promise of improvement. Some quotations noted are: Consolidated California & Virginia, $1 15; Chollar, $1 05; Ophir, 90c; Hale & Norcross, 85@ 88c.; Confidence, 82c.; Best & Belcher, 61@63c.; Sierra Nevada, 41c.; Gould & Curry, 28@29c. A little was done in Standard Consolidated at $1.65.

The sales on regular call at the San Francisco Stock Exchange for the first three months of the year were as follows:

	1896.	1897.
January, shares	296,415	274 280
February	183,790	165,695
March	246 105	188,745
Total	726,310	629,720

A falling off o f97,000 shares from last year, is discouraging especially when we find that the March sales this year were 86,000 shares less than those of January.

The California Debris Commission has received new applications to mine by the hydraulic process from T. C. Cox and W. C. Pidge in the Philadelphia mines, near Columbia, Tuolumne County, to deposit tailings in Rose and Eagle creeks, and from F. G. Curnow and others in the Little Grass Valley mine, near Columbia Hill, Nevada County, to deposit tailings in an old reservoir.

The Golden State Mining Company of Idaho has levied an assessment of 0·016⅝c, per share, delinquent May 1st. This is one of the smallest assessments ever levied.

The Pennsylvania Mining Company, of Grass Valley, has declared its fourth dividend at the rate of 5c. per share.

The legislature this year has made several changes in the laws affecting mining stocks. Under the repeal of the act imposing a tax on the issue of certificates of stock corporations, which has been in force since 1878, the tax which brokers and stockholders have had to pay at the rate of 10c. per certificate on all stock transferred and issued at the offices of the companies has been abolished. This will effect a considerable saving to brokers. Hereafter the monthly financial statements of the mining companies sworn to by the presidents and secretaries will be filed at their offices on the second Monday of each month, instead of the first Monday. This is in accordance with the amendment to section 1 of the act of 1874. The amended section reads in part: "It shall be the duty of the directors on the second Monday of each and every month to cause to be made an itemized account or balance sheet for the previous month." Section 3 of the same act has also been amended so that instead of incurring a penalty of $1,000 for non-compliance with this law, the directors will be only liable for the actual damage, if any, sustained by a stockholder, with costs of suit.

Spokane, Wash. April 2.

(From Our Special Correspondent.)

The local mining stock market has been variable this week. At the opening there were signs of more activity, but the trading grew gradually smaller as the week advanced, until to-day the market closes dull. However, the sales this week exceeded those of last week by 23,550 shares, being 69,850 shares. The increase in transactions was due principally to the selling of large blocks of the lower-priced stocks. Slocan Reciprocity showed the largest single deal, being 20,000 shares at 6c. There were also sales of 5,000 shares of Minnehaha at 3c., 8,500 shares of Briggs at 5c., and 3,000 shares of Diamond Dust at 1½c. Only a few of the Trail Creek stocks were traded in this week, and among them may be mentioned Rossland Red Mountain with transactions of 250 shares at 21c., an advance of 2c. from last week; Evening Star of which 10,000 shares were sold at 11c., and Alberta with transactions in 7,000 shares at 11c. This latter stock and Primrose were added to the list of the exchange this week. Of Primrose 2,500 shares changed hands at 10c.

The higher-priced stocks were quiet. Noble Five Consolidated of Slocan showed 1,100 shares at 57@ 58c.; Rambler Consolidated, of the same district, 500 shares at 52½c., a drop of 1¼ points, and Cariboo 500 shares at 47½c., a fraction lower than it ruled a few days ago.

British Columbia.

(From Our Special Correspondent.)

Rossland, April 1.

On the Mining Stock Exchange the members of the board have adopted a set of rules for its government. The chief regulations are: 1. That the stocks shall be open with a call at 11 o'clock and that there shall be another call at 2 p. m. 2. Commissions shall be charged and paid in all transactions and the minimum rates shall be as follows: Stocks selling under 50c., ½c. per share; selling at 50c. and under $1, 1c. per share; at $1 and over, 2c. No commissions on any sale less than $2.

All purchases and sales shall be settled for on delivery, and all deliveries unless otherwise provided shall be made before 11 a. m. on the first business day following.

Any member who shall neglect to pay his dues or fines for five days after they become payable shall, after due notice, be suspended until they are paid, and if not paid at the end of three months, he shall no longer be considered a member and his membership shall be forfeited to the association.

London. March 27.

(From Our Special Correspondent.)

Political events continue to exercise a disturbing influence on the South African mining market. The evidence of Mr. Schreiner before the South African Parliamentary enquiry has been very much resented in South Africa, especially in Cape Colony, and public protests have been made there and public denials that his opinions in any way represented the true state of things. These demonstrations in Cape Colony are having an irritating effect on the Dutch in the Transvaal, and naturally they postpone the restoration of peace between the two races. Dealers in the market give a good deal of attention to this matter, and while the uncertainty prevails they keep aloof from dealing. On the other hand, the withdrawal of the Transvaal judges from their independent position has removed the strain between the executive and the parliament, so no trouble is expected now to rise from the former deadlock. Again, the Transvaal government has appointed a committee to look into the grievances of the miners. This is taken as an evidence of the desire of the government to meet the reasonable demands of the miners and to put the mining industry on a more satisfactory footing.

The shutting down of several mines has had a very bad effect on the market. The Consolidated Gold Fields has closed down four of its deep-level shafts, and Bantjes and Vogelstruis are to be closed down shortly. There are many rumors also of other mines closing down.

A dead-set has been made on the Consolidated Gold Fields and the allied companies. Rumors have been floated around announcing the probability of Consolidated Gold Fields amalgamating with Gold Fields Deep. The latter company owns three-quarters of Robinson Deep shares, and if amalgamation took place it would be much easier to sell these shares, which at the present time Gold Fields Deep finds it impossible to dispose of. Another rumor sent round the market was to the effect that Consolidated Gold Fields are requiring more capital, and that it is intended to create 300,000 new shares and to issue them at £5 10s. each. This additional capital is required to develop some of the deep-level mines and to put them on a paying basis. Certain circles on the Stock Exchange have taken the opportunity of inventing other adverse rumors. As regards other companies operating in South Africa quotations remain about the same, and very little business has been done.

The West Australian section has been very quiet all week. Some colonial orders came over for Great Boulders, but otherwise buying has been restricted within very narrow limits. No new strikes at any of the mines have been reported and no exceptional reports have been published.

The Indian section has been strong, chiefly on the meeting of the Mysore Company and the reports published by the Nundydroog and the Ooregum companies.

The American section has not been to the fore at all this week and there has been a lull in British Columbians.

Some time ago I mentioned that the Springdale Gold Mining and Milling Company was in difficulties and that the English shareholders wished to reconstruct the company under the English limited liability law. Since then the American shareholders have consented to this proposal, so a new company is to be registered in London called the Springdale Gold Mining Company, Limited, to take over the various properties. The nominal capital will be £125,000 in 1,000,000 shares of 2s. 6d. each. These shares will be credited with 2s. 3d. paid up, and the shareholders in the old company are entitled to allotments of shares in the new company share for share on the payment of a first call of 1½d.

A company which has hitherto operated in South Africa has recently acquired some property in Colorado. This is a company called the Big Golden Quarry, Limited. This company was originally formed about 10 years ago to work some properties in the DeKaap Gold Fields in the Transvaal. The business was evidently mismanaged, for the shareholders stepped in about a year ago and changed the directorate. The new management obtained other properties in the Transvaal, but they also obtained some in Colorado. It is not possible to form any very clear idea of the exact value of these properties. They are situated near Central City, are called respectively the Packard Mammoth, and the Nuckalls and are between the Mammoth and the Gregory Bobtail. They have been inspected and are apparently being worked by Mr. Wm. Weston and Mr. Arthur L. Collins. They are not yet shipping any ore; but the ore is being stacked up until the Gregory-Bobtail tunnel is completed. Then the ore can be taken out by gravitation instead of by hauling and the cost considerably reduced.

Paris. March 29.

(From Our Special Correspondent.)

Perhaps the most notable point of the week has been the great strength of the metallurgical shares. This is not to be wondered at, since they all report larger orders than ever. Thus the Creusot Company has lately taken contracts for 70 locomotives for France, 3 torpedo boats for the Navy, 6 heavy guns for Russia, 60 guns for Bulgaria and a number of iron railroad bridges for China.

The Courite des Maitres de Forges has prepared the statistics of iron production in France for 1896. The output of pig iron for the year, as compared with 1895, was as follows, in metric tons:

	1895.	1896.
Forge and steel pig	1,530,804	1,840,341
Foundry iron	473,064	493,361
Total	2,003,868	2,333,702

There were 8,864 tons of pig iron out of this total made with charcoal. The output of wrought iron for the year 1896 was 814,643 tons, showing an increase of 57,850 tons over 1895. Of the total in 1896 there were 89,710 tons of plates, 724,057 tons of bar and other merchant iron and 876 tons of rails, the last being the small survival of a great business. The production of steel is given as follows, in metric tons:

	1895.	1896.
Rails	152,394	170,675
Plates	182,322	211,771
Bars, shapes, forgings, etc.	379,807	501,062
Total	714,523	883,508

The statement does not give open-hearth steel separately; of the total in 1896 there were 861,853 tons of Bessemer and open-hearth steel, the remaining 21,655 tons being crucible, puddled and other special steels.

The foreign merchandise trade of France for the two months ending February 28th is reported by the Ministry of Commerce as below:

	1896. Francs.	1897. Francs.
IMPORTS:		
Food	187,709,000	152,778,000
Raw Materials	373,814,000	434,979,000
Manufactures	98,354 000	94,493,000
Totals	659,877,000	682,250,000
EXPORTS:		
Food	86,983,000	78,544 000
Raw Materials	131,647 000	127,556,000
Manufactures	284,300,000	267,372,000
Postal Parcels	23,204,000	28,784,000
Total	525,434,000	502,256,000
Excess, imports	134,443,000	179,994,000

There was this year an increase of 22,373,000 fr., or 3·4% in the imports, but a decrease of 23,178,000 fr., or 4·4% in the exports.

I have before written you of the embarrassment and loss—chiefly to those who cannot well afford it—caused by the enforcement of the law which deprives all silver coin of a date prior to 1864 of currency, so that such coin has only a bullion value. In a recent article in the *Journal des Economistes*, M. de Molinari makes some sharp observations on the loss thus imposed by the State on holders of this demonetized small coin. At the money-changers, according to the rates fixed, English bronze coin loses 10%, Italian 20, Luxemburg 40, while French silver out of circulation is depreciated 60%. For the equivalent of two francs of English bronze coin the changer pays 1·50 fr.; if Italian, 1·40 to 1·50 fr.; if Luxemburg, 1·20 fr.; but for a 2-franc silver piece of the reign of Louis Philippe, Charles X., Louis XVIII. or Napoleon I., 80 centimes only. The State obliges the Bank of France to reimburse its old notes in full, but claims the right to refuse to redeem its own old coins.

The political situation is still far from clear; but we are getting used to it, and it has disturbed the financial and stock markets less than for several weeks past.

AZOTE.

MEETINGS.

Alaska Juneau Gold Mining Company, at 320 Sansome street, San Francisco, Cal., on April 21st, at 2 p. m.

Boston & Montana Consolidated Copper and Silver Mining Company, annual meeting at Butte, Mont., on April 29th.

Bulwer Consolidated Mining Company, annual meeting, at 310 Pine street, San Francisco, Cal., on April 14th, at 12 m.

Colorado Mexican Gold and Silver Mining and Milling Company, Limited, deferred annual meeting at Colorado Springs, Colo., on April 28th, at 2 p. m.

Colorado Mining Stock Exchange, annual meeting at the Mining Exchange Building, Denver, Colo., on April 24th.

Enola Mining and Milling Company, annual meeting at 1609 North Weber street, Colorado Springs, Colo., on April 28th, at 9 a. m.

Great Northern Coal Company, at Everett, Wash., on May 10th.

Laramie Range Gold Company, 649 West Fifty-ninth street, Chicago, Ill., on April 24th, at 7:30 p. m.

Montana Gold, Silver, Platinum and Tellurium Mining Company, annual meeting, at Great Falls, Mont., on April 13th, at 7 p. m.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Dinq.	Sale.	Am.
Alpha Con.	Nev.	18	Apr. 5	Apr. 27	.05
Alta Silver	"	55	" 8	" 29	.05
American Quartz	Cal.	1	Mar. 22	" 12	.01
Anita Gold	"	13	Apr. 2	" 20	.05
Belcher Silver	Nev.	54	" 6	" 27	.25
Brunswick Con.	Cal.	11	" 20	May 15	.03
California	"	11	Mar. 30	Apr. 17	01
Channel Bend	"	7	Apr. 21	May 17	.02
Confidence Silver	Nev.	28	" 16	" 7	.30
Con. Cal & Va	"	8	" 13	" 3	.25
Con. Imperial	"	38	Mar. 23	Apr. 13	.01
Crown Point	"	70	Apr. 28	May 19	.20
*East Best & Belcher	"	5	" 29	" 13	.15
Eldorado Gold	Utah.		" 12	" 3	.01
Emerald	"		" 15	" 4	.00½
Fish Springs	"		Mar. 27	Apr. 24	.04
Golden Fleece	Cal.	19	" 30	" 24	2.00
*Golden State	Ida.		May 1		00⅓
Goldstone	"		Apr. 22	May 13	.10
Hale & Norcross	Nev.	111	" 23	" 14	.10
Henrietta	Cal.	1	" 26	" 17	.06
*Home Gold	"		" 14		.05
Horseshoe Bar, Con.	"	7	" 17	May 8	.10
Jamison	"	9	Mar. 26	" 21	.05
Kentuck Con.	Nev.	13	Apr. 13	" 5	.05
Little Pittsburg	Utah	12	Mar. 26	Apr. 15	.01½
Lone Hill	Cal		" 20	" 15	.01½
Lucky Bill	Utah.	24	Apr. 20	May 10	.01½
Mexican	Nev.	56	" 7	Apr. 29	.50
Mineral Hill	Cal.	1	Mar. 15	" 13	.05
Minnie	Utah.		Apr. 6	June 7	.00⅛
Orleans	Cal.		" 14	May 3	.10
Potosi	Nev.	47	" 14	" 5	.20
Reward Gold	Cal.	2	" 19	" 11	.03
Sevier	Utah.		" 3	" 19	.01
Sierra Nevada	Nev.	112	" 6	Apr. 23	.20
Snowflake	Utah		Mar. 29	" 29	.01
Sulphur Bank Q	Cal.	5	May 3	June 3	.25
Sunbeam Con.	Utah.	9	Apr. 21	May 7	.00½

*New assessment.

DIVIDENDS.

NAME OF COMPANY.	Current Dividends. Date.	Am't.	Paid since Jan. 1, 1897.	Total to date.
*Aetna Con. Q			$50,000	$90,000
Alaska-Mexican			18,000	191,031
Alaska-Treadwell			75,000	3,100,000
Alice	Apr. 7	$20,000	20,000	1,015,000
*Anchoria-Leland			18,000	48,000
Arizona Copper			48,000	
Atlantic Copper			40,000	740,000
Bald Butte			5,000	475,000
Boston & Montana	May 20	450,000	900,000	5,825,000
*Bullion Beck			170,000	2,117,000
Calumet & Hecla	Apr. 23	500,000	2,000,000	48,850,000
*Cariboo			16,000	140,965
*Centennial Eureka			90 000	1,950,000
Charleston			10,000	150,000
Coronas			4.5 0	9,500
*Daly			37,500	2,925,000
Della S			10,000	60 000
*Elkton Con			65,000	231,960
*Florence			10,838	125,318
Galena			5,000	71,000
Garfield-Grouse			12,000	24,000
Gold Coin			15,000	120,000
Golden Fleece			6,0 0	569,179
Hecla Con			30,000	2,175,000
Highland			20,000	3,344,918
*Homestake			93,750	6,181,250
*Hope			20,000	672,252
*Idaho			60,000	152,000
Iowa Gold			5,000	65,000
*Isabella			56,250	258,750
Last Chance			20,000	40,000
*Le Roi			100,000	350,000
*Mercur			75,000	650,000
Mont. Ore Pur. Co	Apr. 15	40,000	80,000	560,000
*Morning Star			36,000	486,000
Napa Con	Apr. 1	10,000	20,000	830,000
*N. Y. & Honduras Rosario	" 20	15,000	60,000	742,500
*Ontario			45,000	13,400,000
Osceola			50,000	2,125,500
*Pennsylvania			5,000	7.725
*Portland			90,000	953,000
Princess			5,000	45,000
Quincy			100,000	2,070,000
*Rambler-Cariboo			20,000	20,000
Reco			100,000	137,500
*Sacramento			15,000	22,000
*Silver King	Apr. 10	37,500	150,000	1,012,500
*Slocan Star			50,000	350,000
*South Swansea			22,500	29.990
*Standard Con			20,000	3,737,868
*Swansea			10,000	31,500
*Two Friends			20.000	20,000
Utah			2,000	175,000
*Victor			60,000	765,000
Totals		$1,072,500	$5,366,368	$116,127,676

* March 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.

NEW YORK.*

Name of Company.	Location.	Par val.	Apr. 3. H.	Apr. 3. L.	Apr. 5. H.	Apr. 5. L.	Apr. 6. H.	Apr. 6. L.	Apr. 7. H.	Apr. 7. L.	Apr. 8. H.	Apr. 8. L.	Apr. 9. H.	Apr. 9. L.	Sales
Alamo	Colo	1	.06		.05						.05		.04		3,900
Alice	Mont	•			.50		.55	.50							2,700
Anaconda	Colo	1					.50	.49							1,000
Anchoria-Lel'd	"	1													
Annetta	"	1	.16⅛	.16	.15⅞				.15¼		.18	.16	.18		8,800
Argentum-Jun	"	5					.25	.24							800
Belcher	Nev	100	† 44												100
Best & Belcher	"	100													
Bodie	Cal	100													
Breece	Colo	25	.20												200
Brunswick	"	1			.07		.08		.07		.08		.09	.08	3,700
Chrysolite	"	5													
ColombianGold	R.of C	5	.43	.41	.45⅛	.43	.49	.45⅛	.52⅛	.50	.54⅛	.52⅛	.55	.52	4,500
Comst. T	Nev	100													
Con. Cal. & Va.	"	100													
Con. Imperial	"	100													
Creede & C. C.	Colo.	1													
Cripple Cr. Con.	"	1	.09												200
Crescent	Utah	25													
Crœsus	Colo	1													
Crown Point	Nev	100													
Dalton & Lark	Utah	1													
Deadwood	S.Dak	25													
Eagle	Colo	5													
Elkton	"	1													
Fanny B	"	1							.07		.08	.07			400
Favorite	"	1													
Garfield Grouse	"	1													
Geyser	Utah	5													
Gold Cliff	Colo	1													
Gold Coin	"	5													
Gold Explor	"	1													
Golden Fleece	"	1													
Gold San Juan	"	1	.22	.21	.21		.23				.23	.22⅛	.22⅛	.22	12,200
Hale & Norcross	Nev	100													
Homestake	S.Dak	100													
Horn Silver	Utah	25	1.60												1[illegible]0
Iron Silver	Colo	2									.34				1,000
Isabella	"	1													
Jack Pot	"	1							.07				.05½		13,000
Japan	"	10	2.00	1.50	2.25	1.88	2.75	1.98	2.75	2.38	3.25	2.25	3.50	2.75	9,500
Jefferson	"	1							.10	.09½	.10¼	.10			400
King & Pemb	Ont	10													
Lacrosse	Colo	10													
Leadville Con	"	10													
Little Chief	"	50													
Mercur	Utah	25													
Mexican	Nev	100	.25												300
Mollie Gibson	Colo	5					.20	.19							600
Mono	Cal	100													
Moulton	Mont	5													
Mt. Rosa	Colo	1													
New Haven	"	1									2.50				1,000
Old Dominion	Ariz	25													
Ontario	Utah	100													
Ophir	Nev	100													
People's	Colo	1													
Pharmacist	"	1			.14				.13		.13				1,200
Phœnix Con	Ariz	100							.04						1,000
Portland	Colo	1					.69								500
Potosi	Nev	100													
Quicksilver	Cal	100													
" pref.	"	100													
Red Bird	Colo	1													
Red Mountain	"	5					.26⅛				.26⅛		.26⅛		5,000
Russell	N. C.	1	.32	.31					.27	.26	.27⅛		.28		12,300
Savage	Nev	100													
Sen. M & M. Co.	Colo	10	1.32	1.28	1.33	1.28	1.35		1.32	1.29	1.41	1.38	2.07	1.59	7,400
Senator pref.	"	10	8.15		8.12	8.10	8.17	8.15	8.1[illegible]		8.2[illegible]		8.65	8.50	51,000
Sierra Nevada	Nev	100													
Standard Con	Cal	100			1.65		1.70		1.70						1,100
Syndicate	"	100													
Union	Colo	1													
Union Con	Nev	100													
Utah Con	"	100													
Victor	Colo	5													
Work	"	1							.06½						100
Yellow Jacket	Nev	100					.30								500

*Official quotations. Sales, Consolidated Exchange, 12,600 shares; New York Stock Exchange, 1,2[illegible]0 shares; New York Mining Exch., 71,680 shares. Total, 8[illegible],4[illegible]0. †Assessment on.

INDUSTRIAL, COAL AND COAL RAILROAD.*

Name of Company.	Par value.	Apr. 3. H.	Apr. 3. L.	Apr. 5. H.	Apr. 5. L.	Apr. 6. H.	Apr. 6. L.	Apr. 7. H.	Apr. 7. L.	Apr. 8. H.	Apr. 8. L.	Apr. 9. H.	Apr. 9. L.	Sales
Balt. & Ohio	100			13⅜				13¾	12⅜	13¼		13¼	12¾	1,500
Ches. & Ohio	100	16⅞		16⅜	16⅝	16¾	16⅝	17		17¼	16⅞	17¼	17⅛	2,650
Col.C.& I.Dev	100													
Col. Fuel & I.	100							17⅜		17⅜		18		300
Col.,H.V.&Tol	100							3⅝		3⅝				250
do. pref.	100													
Col. & H.Coal	100													
Del. & Hud. C	100	102⅞	101⅛	103¾	101½	103⅛	102⅝	104⅛	103½	104⅜	104	104⅛	102⅛	15,699
Del., L. & W.	50			152	151	150¼	149⅞			152½	152	152⅛		1,940
General Elec.	100	31⅜		31⅜	31½	31½		32	31⅛	32	31⅝	31¾	31¼	2,100
Lake Erie&W	100									14		13⅞		300
do. pref.	100													
Morris&Essex	100													
Nat'l Lead	100	23¾				23⅛		23⅜		23⅛		23⅛		350
do. pref.	100									92¼	91⅛	91¼		13
N. J. Central	100	79⅛	77¾	80⅜	78¼	78	76¼	77½	76¼	79	77⅝	79⅝	76⅞	157[illegible]90
N. Y., L.E.&W	100													
do. pref.	100													
N.Y.,Ont.&W.	100	13⅜	13⅛	13⅜		13⅛	13⅜					13⅝	13⅜	1,100
N.Y.,Susq.&W	100			7⅜	7¼									200
do. pref.	100							23		23	22⅜			600
Norfolk & W.	50													
do. pref.	50									24⅛				15
Phila. & Read.	50	21⅛	2[illegible]¾	21⅜	20¾	21⅞	20⅜	21	20½	21¼	21⅛	21	19⅜	33,384
Tenn. C. & I.	100	25½		25⅜	25¼	25⅛		25⅛	24½	25⅜	25	25¼	24⅛	10,4[illegible]4
do. pref.	100													
Wheel. & L. E	100													
do. pref.	100													

* Official quotations N. Y. Stock Exchange. Total shares sold, 227,9[illegible]5.

SAN FRANCISCO, CAL.*

Name of Company.	Location.	Par. value.	Apr. 2.	Apr. 3.	Apr. 5.	Apr. 6.	Apr. 7.	Apr. 8.
Andes	Nev.	100	.17	.17			22	21
Belcher	"	100	.37	.36			28	.37
Best & Belcher	"	100	.61	65			.66	.55
Caledonia	"	100	.10	.10			.12	.12
Chollar	"	100	1.15	1.05			1.10	1.10
Confidence	"	100	.80	.82			.82	80
Con. California & Virginia	"	100	1.15	1.15			1.40	1.55
Crown Point	"	100	.16	.16			.16	.[illegible]5
Gould & Curry	"	100	.26	27			.35	.34
Hale & Norcross	"	100	.89	.91			.89	.85
Mexican	"	100	.21	.41			45	
Occidental	"	100	.14	.14			.16	.16
Ophir	"	100	.87	.89			1.00	1.00
Potosi	"	100	.32	.31			.34	.31
Savage	"	100	.25	.2[illegible]			.29	.27
Sierra Nevada	"	100	.40	.4[illegible]			.48	.46
Standard	Cal.	100						
Union Con	Nev.	100	.23	.24			.27	.25
Yellow Jacket	"	100	.28	.27			30	28

*Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD.* Week ending Apr. 8.

Name of Company.	Location.	Par value	Bid.	Ask.	Name of Company.	Location	Par value	Bid.	Ask.
Balt. M. & S.	N. C.	5			Howard C.&C	Md.	5		
Conrad Hill	"	10			Lake Chrome	"	5		
Con. Coal	Md.	100	38	40¼	Ore Knob	"	10		
G. Cr'k Coal	"	100	106	109	Silver Valley	N. C.	5		

*Official quotations Baltimore Stock Exchange.

BOSTON, MASS.*

Name of Company.	Location.	Par val.	Apr. 2. H.	Apr. 2. L.	Apr. 3. H.	Apr. 3. L.	Apr. 5. H.	Apr. 5. L.	Apr. 6. H.	Apr. 6. L.	Apr. 7. H.	Apr. 7. L.	Apr. 8. H.	Apr. 8. L.	Sales.
Allouez	Mich	25													
Anaconda	Colo	1													
Arnold	Mich	25	2.75	2.50									2.63		300
Atlantic	"	25			20.00								21.00		30
Bonanza	Nev	100											.55		100
Bost. & C. C	Colo	1							.12	.10					800
Bost. & Mont.	Mont	25	121¼	119⅜	120½	119⅜	121	120	121⅛	120⅛	124⅜	121⅛	126⅜	125	12,431
Butte & Bost.	"	25	16.88	16.2[illegible]	16.88	16.5[illegible]	17.00	15.88	16.50	15.75	16.63	16.50	17.63	16.75	14,228
Cal. & Hecla	Mich	25	370				370				370		370		14
Centennial	"	25	7.50	7.00	7.7[illegible]	7.63	7.43		7.50		7.50	7.25	8.00	7.25	2,021
Dominion Coal	N. S.	100	9.00	8.00	9.25	9.00	9.00	8.25	10.00	8.50					3,794
do. pref.			80.00												15
Franklin	Mich	25					11.00						11.00		135
Gold Coin	Colo	1	5.38	5.13	5.25		5.13		5.25	5.13	5.25	5.0[illegible]	5.13		2,135
Humboldt	"	1													
Illinois Steel	Ill.	100							32.50		32.00		32.50		245
Kearsarge	Mich	25	16.00	15.00	16.00		16.00		16.25	16.00	16.25				900
Lake Sup. Iron	"	25													
Merced	Cal	15	9.00	8.[illegible]5					8.50						154
Napa	Cal	7													
National	Mich	25													
Old Dominion	Ariz	2	14.00	13.75			14.25	14.00	14.50	14.13					510
Osceola	Mich	25	29.25	28.75	30.00	29.50	30.00	29.50	30.00				30.50		618
Pioneer	Cal	10	5.75	5.13					5.75	5.50	5.50	5.25			1,970
Quincy	Mich	25	107				108⅛	107⅛	109		110		110		129
do. scrip	"														
Ridge Mining															
San. Ysabel (G.)	Cal	5													
Tamarack	Mich	25	120	118	118⅛	118	119		119	118⅛			120		225
Tamarack, Jr.	"	25	17.0[illegible]												100
Tecumseh	"	25													
Westingh E.&M	Pa.	50													
do. pref.	"	50			51.00				51.00		51.00		51.00		91
Wolverine	Mich	25	9.00	8.75	9.00	8.75	9.25	9.0[illegible]	8.88	8.75	9.25	9.13	9.25	9.13	1,621

* Official quotations Boston Stock Exchange. Total sales, 42,545.

COLORADO SPRINGS, COLO.

Name of Company.	Par val	Mar. 29. H.	Mar. 29. L.	Mar. 30. H.	Mar. 30. L.	Mar. 3[illegible] H.	Mar. 3[illegible] L.	Apr. 1 H.	Apr. 1 L.	Apr. 2 H.	Apr. 2 L.	Apr. 3. H.	Apr. 3. L.	Sales.
Ajax	$1													
Alamo	1	.04⅞		.04⅞				.05	.04⅛					9,000
Am'ric'n C	1													
Anaconda	5	.55		.54⅜	.54¼	.53⅛	.52¼	.53⅜	.53	.54	.53⅜	.53⅜		10,156
Aola	1													
Arg'ntumJ	2					.29⅛	.28			.27		.27⅛		18,300
Bangkok	1													
Bankers	1													
Banner	1													
Ben Hur	1													
Blue Bell	1													
Bob Lee	1									.007				1,000
Bost. & C.C.	1													
Bucknorn	1													
Colo.C.&M.	1													
Columbine	1													
Copper M	1													
Cr. & C. C.	1													
C. C. Con.	1	.19⅛				.09⅜	.07⅛					.09		2,000
Cr.Cr.Exp.	1													
Crœsus	1													
Des Moines	1			.02⅛	.02	.02⅛						.02⅛	.02	14,000
Elkton	1	1.2[illegible]	1.21	1.20⅛	1.17¾	1.17⅛	1.12⅛	1.17⅛	1.12⅛	1.19⅛	1.16¾	1.20	1.18	40,400
Enterprise	1													
Fanny R.	1							.08		.03⅛				2,500
Favorite	1													
Franklin	1													
Garfield-G.	1													
Gold. Age	1													
Gold. E'g'e	1													
Gold Fl'ce	1					.20								40
Gold & Gl.	1													
Gold King	1													
Gold Stand	1													
Gould	1													
Grotte	1													
Henrietta	1													
Humboldt	1													
Ida May	1													
Ingham,C.	½													
Iron Clad	1													
Isabella	1	.40⅛	.40⅜	.41¼	.40	.40		.40⅛	.40	.41⅜	.40⅛	.41⅜	.40⅝	61,050
do.stamp	1				.40									500
Jack Pot	1	.08		.07⅞	.07⅜	.07⅜		.07⅝	.07⅜	.07⅛	.07¼	.07¼		33,000
Jefferson	1													
Keystone	1													
Ladessa	1													
L'nc'ln B'y	1													
LottieGib.	1													
Marion	1													
Matoa	1					.08⅞								1,000
Mollie G.	5	.21½	.21			.20	.19	.20	.19⅛					2,500
Monarch	1													
Mt. Rosa	1			.09⅛		.09⅛				.09⅜	.09¼	.09¼		8,500
Mutual	1													
Nugget	1													
Ophir	1													
Oriole	1					.01⅜		.01⅜						3,000
Orphan B.	1													
Pappoose	1													
Pharmacist	1	.14⅛	.14	.14⅜	.14	.14¼	.14⅛	.14½	.14¼	.14⅛	.14⅛	.14¼		122,100
Pilgrim C	1											.01¼	.01⅛	3,500
Portland	1					.77				.79½	.76	.76	.74	1,900
Reno	1													
Sacrameto.	1													
Silver St.	1													
Specimen	1											.05		1,000
Sq'w Mt.T.	1													
Temonj	1													
Trachyte	1			.02		.01⅞						.02		10,000
Union	1					.13	.14⅛	.15⅞	.15	.15¼	.14⅞	.15⅜	.15¼	28,300
Virginia M.	1													
Work	1	.06¼		.06⅜		.06⅜	.06⅛	.06½		.06⅛		.06⅜		11,800

Official quotations Total shares sold listed, 41[illegible],[illegible]46; unlisted, [illegible]8,400.

CLEVELAND.

Name of Company.	Par value.	Apr. 7. Bid.	Apr. 7. Ask.	Name of Company.	Par value	Apr. 7. Bid.	Apr. 7. Ask.
Aurora	$25		$4	Lake Superior	$5		$25
Chandler	25	$35	40	Minnesota	100		
Cleveland-Cliffs Iron	100		3[illegible]	Pittsburg & L'ke Angeline	25	$70	
Jackson	25			Republic	25	10	12

BRITISH COLUMBIA. Week ending March 27.

Name.	Selling price.	Name	Selling price.	Name.	Selling price.
Bound'y Creek:		**Trail C'k** (con.:)		**Trail C'k** (con.):	
Old Iron Sides	$0.06	Butte Gold-Copper	$0.04	Josie Mac	$0.08
C'p McKenney:		Br Col. G. King	.10	Kohinor	08
Cariboo M.& S.Co.	.48	Caledonia		Kootenay, London	10
Ainsworth & Nelson Dis.:		California	.15	Le Roi	7.50
		Colonna	.25	Lily May	.20
Dellie M. & M. Co	.14	Commander	.20	Little Darling	.05
Colville Res.:		Crown Point	.45	Mabel	.10
Burton		Deer Park	.20	Mayflower	.15
Fidelity G & C.Co	.10	Dundee	.05	Monita	20
Joe T. Gold M. Co.	08	Enterprise	.20	Monte Cristo	
Mountain View	.05	Evening Star	.11	Morning Star	.07⅛
Idaho District:		Georgia	.13	Nest Egg	
Daisy Group	10	Gertrude	.05	Northern Bell	.12⅛
Oro Pinar Placer	.12⅛	Good Hope	.05	O. K	.25
Slocan Dis.:		Great Western	.15	Palo Alto	.05
Idler	.07⅛	Hattie Brown	.10	Phœnix	.10
Noble Five Con	.58	Helen	.03	Red Eagle Lee	.10
Rambler Con		High Ore	.05	Red Mt View	.05
Reco		Homestake	.10	Rossland Red Mt.	.18
Slocan Star	2.55	Imperial	.05	St. Elmo	.07
Wonderful Group	.08	Iron Coet	.10	Silver Bell	.15
Trail Creek:		Iron Mask	.40	So. Cross & Wolver. C.	.18
Alberta	.15	Iron Horse		St Paul	.12
Big Chief	.10	Ivanhoe	.10	War Eagle	.08
Big Three	.15	Josie	.08	West Le Roi	.15
Blue Bird	.10	Jumbo	.50	White Bear	.18

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

LONDON. Mar. 26

Name of Company.	Country.	Product.	Authorized capital.	Par value. £ s. d.	Last dividend. Amt. s.d.	Last dividend. Date.	Quotations. Buyers £ s. d.	Quotations. Sellers £ s. d.
N'th Americans:								
Alaska-Mexican	Alaska	Gold	£200,000	1 0 0	0 4.8	Jan., 1897	1 2 6	1 7 6
Alaska-Treadwell	"	"	1,000,000	5 0 0	1 6	" "	4 15 0	5 0 0
De Lamar	Idaho	Gold & silver	400,000	1 0 0	1 0	Nov., 1896	6 6	7 6
Hall Mines	BritishCol	Cop. & Silver	250,000	1 0 0			1 2 6	1 5 0
Montana	Montana	Gold & silver	660,000	1 0 0	0 3	June, 1896	3 6	4 6
Palmarejo	Mexico	" "	800,000	1 0 0			1 0	1 6
Pinos Altos	"	" "	100,000	1 0 0			1 3	3 9
Plumas-Eureka	California	Gold	281,250	2 0 0	0 6	Oct., 1896	2 6	5 0
Richmond	Nevada	G'ld, sil., le'd	270,000	5 0 0	1 0	Dec., "	8 9	11 3
Sierra Buttes	California	Gold	245,000	2 0 0	0 6	Apr., "	2 6	5 0
Springdale	Colorado	"	260,000	4 0	0 2	Sept., 1894	3	6
S'th Americans:								
Colomb. Hydra'lic	Colombia	Gold	75,000	1 0 0	1 0	July, 1895	6 3	8 9
Frontino & Bolivia	"	"	140,000	1 0 0	2 0	Mar., 1897	1 5 0	1 10 0
St. John del Rey	Brazil	"	562,000	1 0 0	xn	Jan., 1895	15 0	17 6
Copper:								
Anaconda	Montana	Cop. & Sil.	6,000,000	5 0 0	5 1¼	Nov., 1896	5 16 3	5 18 9
Cape Copper	So. Africa	Copper	600,000	2 0 0	3 0	Dec. "	2 5 0	2 10 0
Copiapo	Chile	"	200,000	2 0 0	1 6	" "	1 17 6	2 2 6
Mason & Barry	Portugal	Cop. & sulph	1,050,000	4 0 0	£1 cp	Dec. "	2 10 0	2 15 0
Rio Tinto	Spain	Copper	3,250,000	10 0 0	18 0	Nov., "	26 2 6	26 7 6
Tharsis	"	"	625,000	4 0 0	7 0	April, "	6 2 6	6 7 6
Australians:								
Bayley's United	W. Au't'lia	Gold	600,000	5 0	0 4	Dec., 1894	2 3	2 9
Broken Hill Prop.	N.S. Wales	Silver	384,000	8 0	1 0	Feb., 1897	2 8 9	2 11 3
Mt. Morgan Gold	Qu'ns'and	Gold	1,000,000	1 0 0	0 6	Mar., "	3 10 0	3 15 0
South Africans:								
British S. Africa Co	So. Africa	Lands & Ex.	500,000	1 0 0	xn.	Jan., '97	2 2 6	2 5 0
City & Suburban	Transvaal	Gold	1,360,000	4 0 0	2 0	" "	3 8 9	3 11 3
†Crown Reef	"	"	120,000	1 0 0	12 0	Oct., 1896	10 5 0	10 10 0
De Beers	CapeCol'y	Diamonds	3,950,000	5 0 0	£1	Jan., 1897	27 2 6	27 5 0
Ferreira	Transvaal	Gold	90,000	1 0 0	30 0	" "	16 5 0	16 15 0
Geldenhuis Est.	"	"	200,000	1 0 0	2 6	Oct., 1896	2 8 9	2 11 3
Henry Nourse	Witw'sr'd	"	125,000	1 0 0	6 0	Jan., 1897	5 7 6	5 12 6
Heriots (New)	"	"	115,000	1 0 0	4 0	" "	7 0 0	7 5 0
Jagersfontein	OrangeF.S	Diamonds	1,000,000	5 0 0	6 0	Sept., 1896	8 15 0	9 0 0
Langlaagte Estate	Transvaal	Gold	500,000	1 0 0	3 0	Jan. 1897	3 12 6	3 17 6
Primrose (New)	"	"	300,000	1 0 0	xrts.	Sept., 1896	3 0 0	3 5 0
Robinson	"	"	2,750,000	5 0 0	5 0	Jan., 1897	7 2 6	7 7 6
‡Sheba	"	"	850,000	1 0 0	1 0	Mar., "	1 16 3	1 18 9
Sim. & Jack (New)	"	"	5,000,000	5 0 0			2 12 6	2 17 6
Wemmer	Witw'sr'd	"	80,000	1 0 0	15 0	Jan., 1897	6 2 6	6 7 6

† Dividend pending. ‡ Ex-dividend.

PARIS. Week ending March 26.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Divs. last year.	Prices. Op'ning.	Prices. Closing
			Francs.	Fr.	Fr	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs.	27,000,000	2,000	80.00	1,949.00	2,010.00
" " Firminy	"	" "	3,000,000	500	85.00	1,770.00	1,800.0
" " Fives-Lille	"	" "	12,000,000	500	35.00	805.00	815.00
" " la Marine	"	" "	20,000,000	500	37.50	1,063.00	1,072.00
" " Longwy	"	" "		500	35.00	865.00	880.00
Aguas Tenidas	Spain	Iron pyrites	10,000,000	500	25.00	115.00	105.00
Anzin	France	Coal			170.00	4,890.00	4,840.00
Boleo	Lower Cal.	Copper		500	65.00	1,940.00	1,895.00
Briansk	Russia	Coal & Iron				1,305.00	1,300.00
Bruay	France	Coal	3,000,000	400	700.00	25,990.00	25,990.00
Callao	Venezuela	Gold	32,200,000	125		4.25	5.00
Cape Copper	S. Africa	Copper		50	1.50	63.00	60.00
Champ d'Or	"	Gold		25		27.50	26.25
Courrieres	France	Coal	600,000	300	160.00	1,610.00	1,680.00
De Beers Consolidated	S. Africa	Diamonds	98,750,000	125	15.63	712.00	702.00
Dombrowa	Russia	Coal		500		600.00	590.00
Dynamite Centrale	France	Explosives		500	12.50	482.50	487.00
Fraser River	Brit. Col'mb	Gold				44.00	45.50
Huanchaca	Bolivia	Silver		125	5.00	61.00	55.00
Huta-Bankowa	Russia	Iron & steel				3,315.00	3,300.00
Langlaagte Estate	S. Africa	Gold	11,750,000	25	11.25	96.00	99.00
Laurium	Greece	Zinc & lead.	16,300,000	500	40.00	655.00	650.00
Lautaro	Chile	Nitrates		125		150.00	144.00
Malfidano	Italy	Zinc	12,500,000	500	40.90	1,015.00	1,040.00
Metaux, Cie. Fran. de	France	Metal d'lers.	25,000,000	500	12.00	645.00	625.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	40.00	750.00	75[illegible].00
Nickel	N. Caled'nia	Nickel	12,720,000	500	30.00	210.00	215.00
Paccha-Jazpampa	Chile	Nitrates				25.00	25.00
Penarroya	Spain	Coal, etc.		500	65.00	1,625.00	1,675.00
Rebecca	Colo'do, U.S.	Gold				9.00	9.25
Rio Tinto	Spain	Copper	81,250,000	250	27.65	682.50	670.00
Robinson	S. Africa	Gold		125	12.50	190.00	192.00
Saint Elie	Fr. Guiana	"	4,000,000	25		35.00	33.00
Salines de l'Est	France	Salt		500	20.00	305.00	300.00
Sels Gem. de la Rus. Mer	Russia	" etc				590.00	599.00
Tharsis	Spain	Copper		50	8.75	172.00	172.50
Vielle Montagne	Belgium	Zinc	9,000,000	80	20.00	530.00	530.00

MEXICO. Week ending Mar. 25.

Name of Company.	State.	No. of shares.	Last dividend.	Last assessment.	Prices. Opening.	Prices. Closing.
Amistad y Concordia	Hidalgo	9,600	$0.7		$30	$28
Angustias	Guanajuato	2,400	10.00		600	620
Arevalo y Anexas	Hidalgo		10.00		360	300
Asturiana y Anexas	Zacatecas	2,500	10.00		210	220
Bartolome de Medina	Hidalgo	2,000	3.50		100	85
Carmen	"	1,100	7.75		350	400
Castellana y San Ram	Tepic	2,448	3.00		100	80
Cerro Colorado	Chihuahua	15,000		$1.00	10	10
Cinco Senores y An.	Guanajuato	2,000	25.00		870	830
Concepcion y Anexas	S. Luis Potosi	2,700			180	100
El Oro	Guanajuato	500			40	60
Guadalupe	"	10,000	2.00		200	180
Luz de Maravillas	Hidalgo	1,100			160	200
Pabellon	"	1,000	27.89		180	200
Purisima de los Com.	Zacatecas	2,400			10	5
Real del Monte	Hidalgo	2,554	10.00		1,000	900
Rosario y Anexas	Durango	4,800			50	40
San Francisco	Hidalgo	2,000	3.00		290	300
S. Ped. Chalchihuites	"	1,000	2.00		100	80
San Rafael y Anexas	"	1,200	20.00		930	900
do. free stock.	"	1,200	14.00		450	410
Sta. Maria de la Paz	S. Luis Potosi	2,400			500	510
Soledad	Hidalgo	960	7.50		400	440
Sorpresa	"	960	5.00		250	300
Trinidad	Guanajuato	2,000			60	50
Tlauzingo	Puebla	2,400			30	40
Union	Hidalgo	2,000	8.00		300	350
Zaragoza	"	1,100			15	15
Zomelahuacan (gold)	Vera Cruz	5,000			100	100
Zona Min. de Pozos.	Guanajuato	2,400		1.50	15	20

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.* Feb. 27.

Name of Company.	Capital.	Share value Nominal	Share value Paid up.	Last Dividend.	Prices. Bid.	Prices. Asked.	Prices. Last sale
Arturo Prat	$3,300,000	$100	$100	1 per cent.	$29	$50	$30
Caracoles	315,000	100	100	5 "			
Descub. de Huantajaya	1,000,000	100	100	3 "			
Huanchaca de Bolivia	8,000,000	25	25	4 "	3⅛	38	37½
Oruro	800,000	200	200		32[illegible]	325	325
S. Agustin de Huantajaya	1,500,000	100	100	2½ per cent.			
Todos Santos	2,000,000	100	100	1 "	15	16	16
Nitrate Cos:							
Agua Santa	3,000,000	50	50	7 "	150	151	151
Antofagasta	2,000,000	200	200	5 "	152½	153	152
Union	3,000,000	200	500		43	45	45

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

SHANGHAI, CHINA.* Mar. 5.

Name of Company.	Country.	No. of shares.	Value. Par.	Value. Paid up.	Last dividend. Date.	Last dividend. Amount.	Price.
Jelebu Mg. & Trad.	China	45,000	$5	$5	Oct., 1894	$0.25	Taels 1.61
Punjom Mg. Co., Ltd.	"	60,000	4	3.75			" 7.23
do. pref	"	30,000	1	1			" 2.26
RaubA'lian G.Mg. Co.	"	200,000	£1	13s. 10d.	Dec., 1893	0.21	" 8.05
Sheridan Con. Mg. Co.	Colorado, U.S	20,000	Taels 100	Taels 100			" 8.00

* Special Report of J. P. Bissatt & Co. The prices quoted are in Shanghai taels.

DENVER, COLO.*

Name of Company.	Par val	Mar 29 B.	Mar 29 A	Mar 30 B.	Mar 30 A	Mar. 31 B	Mar. 31 A.	Apr. 1 B.	Apr. 1 A	Apr. 2 B.	Apr. 2 A.	Apr. 3 B.	Apr. 3 A.	Sales
L'd Mines														
Anaconda	$5	.55¼	55½	55⅛	.55⅛	.53	.53½	53	.54	53⅛	54⅛	.54		27,900
Arg. J	1	24	26	.24		29¼	30	28⅛	.29⅛	26½	27½	.26	.28	5,900
Bankers	1	.07⅜	08½	.07¾	08	.07¼	.07⅜	07¼	.07⅝	.06⅜	.07	.07		6,000
Garf. Gr	1		.08	06⅝		.06⅛	.06⅝	07	.07⅜	07⅜	.07⅝	.07	.07¼	21,500
Gold. Fleece	1	.24						.26	.30	28	29½	25½	.30	2,300
Gold Stand.	1	.04⅜	.04¾	04½	05	.04⅛	.04⅜	.04½	.04¾	.04½	.04⅞	.04⅜	04⅞	1,000
Insley	1	.004¼	.004½	004½	.005	004¼	.004¾	005	005¼	005	005⅛	005	005½	5,000
Iron Clad	1	06⅜	.06½	06⅜	.06⅛	06¼	.06⅜	.06⅛	06⅛	.06¼	.06½	.05⅝	.06⅞	11,000
Isabella	1	.40⅝	40⅞	.40	.40½	39⅜	40	40	40¾	.40⅛	40½	.40⅛	.41	7,900
Jefferson	1	09¾	10	.08⅛	.10	09	.10¼	.08½	.09⅞	.09	.09¼	.09½	.09⅜	3,000
Mollie Gib.	5	.20	.23	.20	.25	.18⅛	.24	.19⅛	.22	.20	.25	19⅜	.24	5,0
Mt. Rosa	1													
Peoples	1													
Pharmacist	1	.14⅜	.14¾	.13⅜	.14¼	.14	.14⅛	.14¼	.14⅝	.13¾	.14¾	.13⅜	.14½	10
List. Pr.														
Aola	1	01⅜	.01⅛	01⅛	.01⅝	.01⅛	.01⅝	.01⅜	.01⅝	.01⅜	01⅝			1,000
Big Johnny	1	.002⅞	003	.002¾	.003¼	002¾	.003⅛	002½	003¼	002¾	003			11,000
Blue Jay	1					001⅛	002			.001¼	.001½	.001	.001½	11,000
C. C. Imp.	1	001½		002	.002½	.001½	.002⅛	001⅛	.001¾			.001	.001½	146,000
Cannon Ball	1	.006½	.007	006½	.006⅜	.006	007	005¾	.006	005	005½	.005	.005⅛	169,000
Dictator	1	.001⅛	.001¾	001¾		001½		.001⅛	.001⅝	001¼	.001¾	001⅛	.001¾	43,000
Dixie	1					.001								2,000
Finance	1			.003	.004½	.003⅛	004⅛			.003⅛	004½			1,000
Geo. Wash	1	.002¾	.003¼	.003¼	003⅛	.003	003⅜	.003	.003¾	003	003½	.003	003⅛	10,600
Gold Field	1			.003	.003					001	.002	001	001½	5,000
Gold. Hope	1													
Gregory	1	.003		.003		.002⅜	003	.002¾	.003	.002	.002¼	.002	002¼	12,000
" Leas.	1	009¾		009⅛	.010					01	.01¼	.01	.01½	21,000
Henrietta	1	003⅜	.008	.003½		003	.009	.003⅜	.004	.003⅜	.005	.003½	.004	10,000
Humboldt	1			.002										2,000
Illinois	1	007½	.007⅜	.007⅛	007¾	.007	007⅛	.006⅜	.007	.006½	.007	.006½	007	25,000
Justine	1	002¼	002½	.002	.002¼	002¼	.002½				.003			14,000
Linc. Boy	1	.001	.001⅛	.001										10,000
Old Gregory	1						03					.02¼	.02½	2,000
Orient						.001⅛	.001	.001⅛	.001			001½	.001¾	1,000
Puritan	1	.002½	.003	.002½	003	.002½	.002⅜	.002¼	.003	002¼	.003	.002¼	002⅜	2,000
Q'n Victoria	1													
Reno	1													
Royal Age	1	003¼	.003⅜	.003⅛	.003⅜	.003¼	.003½	.004	.003⅝	003	.003¼	.004	004¼	193,000
Senator	1													23,000
Sentinel	1	001½	.001¾	.001⅞	.002	001¾	.002	.001⅜	.002	001¾	.002	.001⅜	.002	212,000
Three H's	1	.002	002¼	002	.002½	.002		.002¼	.002½	.002¼	.002½	.002	.002½	24,000
Unity	1													
W. Cr. Con.	1													
Unl. Act.														
Ætna	1	.004¼				.004	.005½					.004	.004½	1,000
Alamo	1													
Arcadia Con	1									.04⅞	.05			2,000
Chimb'razo	1	.004¾	.005	004¾				.004	.004½	.003¾	.004			
Bob Lee	1													
Bost. & C.C.	1													
C. C. & M.	1									.02⅛	.02½	.02¼	.02⅜	14,000
Cr. & C. C.	1													
C. K. & N.	1	007⅜	.008¼	.007¼	.008	.007⅛	.008¼	.007	.007½	005	.007	007	.008	17,000
Elkton	1					1.12	1.16½	1.17½	1.18	1.18	1.19	1.19	1.20	200
Gold Stone	1					.006	.008			.005				1,000
Jack Pot	1	07⅝	.08	07⅜	.07⅞	07⅜	.07⅝	.07⅜	.07⅝	.07¼	.07⅜			2,000
Lit. Dorritt	1													
Mt. Beauty	1	.02	.02¼			.02	.02¼	.02¼	.02⅝	.02⅞	.03	.02⅞	.03	1,000
Old Gold	1	.004⅜	.005	.005	.005¼	.005	.005¼	.005	.005¼	.005⅛	.005⅜	005¼	.005½	76,000
Portland	1					.79	.82	.78	.82			.75	.76	100
Santa Fe	1	.001¼	.001⅛	001¼	.001½			001¼	001⅛	.001½	.001¼	.001¼	.001⅛	75,000
Squaw Mt.	1													
Union Gold	1	.18	.19	.17		.16	.17	.15½	.16	.15⅛	.15¼	.15⅜	.15½	18,500
Va. M.	1	.06¼	06⅜	.06⅜	06⅛	.06½	.06⅝	.06½	06⅝	.06⅜	.06⅝	.06⅛	.07	43,000
Work	1	06¼	.07¼	.06				05½	.05¾			.06	07	1,000

* Official quotations Colorado Mining Stock Exchange.
Shares sold, listed, 1,094,700; unlisted, 251,800. Total, 1,346,500.

SALT LAKE CITY, UTAH.* Week ending Apr. 3.

Stocks.†	Par value.	Bid.	Asked.	Actual selling price.	Stocks †	Par value	Bid.	Asked.	Actual selling price.
Ajax	$10	$0.62½	$0.65	$0.64	Horn Silver	$25	$1.60	$2.00	$1.85
Alliance	1		.35		Little Pittsburg	5	.03½	.03¾	.03⅝
Am. Nat. Gas		.01½	.02½	02	Lucky Bill	10	.14	.18	.17½
Anchor	20	1.00	1.25	1.20	Malvern	2½	.20	.25	
Annie	1		.10		Mammoth	25	1.55	1.60	1.57½
Bogan	1	.05	.08		Mercur	25	7.35	7.50	7.40
Brick Con		40	.60		Morgan	125	.18	.20	19
Bullion Beck & C.	10	7.05	8.00	8.00	Northern Light	5	77½	80	.78½
Buckeye		14	14½	.14½	Ontario	100	8.40	8.75	8.50
Centen'l Eureka	50	47.50	55.00	50.00	Overland	5	.20	.40	
Dalton	5	02¼	.02½	.02¼	Rover	10	.42½	.45	.45
Dalton & Lark	1	16	.17½	.17½	Silver King	20	16.00	17.00	16.50
Daly	20	4.25	4.50	4.50	Sioux Con	10	80	1.00	
Daly West	20	7.75	7.90	7.85	Sunshine	10	.27½	.30	.30
Dexter		1.75	1.80	1.80	Swansea	5	2.20	2.25	2.20
Eagle	10	.03½	04½	.03½	So. Swansea	1	1.65	1.70	1.70
Four Aces	1	.11	.12	.12	Tetro	1	.04	.05	.04½
Galena	10	1.00	1.05	1.02½	Utah	10	1.00	1.07½	1.05
Geyser-Marion	5	1.35	1.40	1.40	Utah Con.	1	.40	.50	
Herschel	5	.15	10						

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

PHILADELPHIA, PA.*

Name of Company.	L'cation.	Par Val'e	Apr. 1. H.	Apr. 1. L.	Apr. 2. H.	Apr. 2. L.	Apr. 3. H.	Apr. 3. L.	Apr. 5. H.	Apr. 5. L	Apr. 6. H.	Apr. 6. L.	Apr. H.	Apr. L.	Sales
Cambria Iron	Pa.		38.00		38.00		38.00		37.50		37.50	37.25	37.50		413
Choc. & Glf. Ctfs	I.T.	50			7.25								7.13		223
Hunt & Br. Top.	Pa.	50													
" pref	"	50	49.50				50.00								15
Lehigh C. & N.	"	50	39.00	38.00	39.00	38.25	39.00	38.25	39.00	38.25	39.00	38.25	39.00	38.50	60
Lehigh Valley	"	50	23.75	23.50	23.75	23.63	23.63	23.50	23.63	23.50	23.75	23.63	23.75	23.50	2,406
Li'le Schuylkill	"	50	53.00		53.00						53.00		53.00		79
Penna. R. R.	"	50	52.38	52.25	52.50	52.38	52.50	52.13	52.75	52.50	53.00	52.75	52.75	52.63	2,397
Pa. Salt Mfg. Co.	"	50													
Penna. Steel	"														
United Gas Im.	Can.						72.50	72.25					72.00		77
Welsb. of Can	Pa.												1.50		140
Welsb. Com'l	"				14.00				14.00		13.00	11.00	16.50	13.00	319
" Com pr.	"			.59½					59.50	59.00	59.00	58.00	59.50	58.00	203
" Light	"				41.00	40.50	40.25	40.13	40.13	40.00	39.50	38.5			807
West Coal.	"														

* Official quotations Philadelphia Stock Exchange. Total sales, 7,169.

HELENA, MONT.* Week ending April 3.

Name of Company.	Location.	Company's office	Par value.	Bid.	Asked	Shares sold.	Price.
Am. Dev. & M. Co.	Mont. & Idaho	Butte, Mont.	$1	$1.00	$1.25	2,700	.90-1.00
Bald Butte	L. & Cl'ke Co.	Helena "	1		2.25		
Bi-Metallic	Granite "	St. Louis, Mo.	5		2.50		
Combination	" "	" "	10		.35		
Granite Mt	" "	" "			1.25		
Helena & Victor	Missoula "	Helena, Mont.	5				
High Ore	Jefferson "	Butte "					
Iron Mountain	Missoula "	Helena "	10	.35	.40	1,000	.35
Judge	Meagher "	" "		.09	.10		
Merrill (Gold)	Jefferson "	Butte "	1				
Ontario	DeerLodge "	Helena "	1				
Yellowstone	Meagher "	" "	5	.12½	15		

* Special Report of Samuel K. Davis. Total shares sold, 3,700.

PITTSBURG, PA.* Week ending April 7.

Name of Company.	Location.	Par val	Bid.	Ask.	Selling price.	Name of Company.	Location.	Par val	Bid.	Ask.	Selling price*
COAL:						NAT. GAS:					
Mansfield	Pa.	50				Allegheny	Pa.	100			
N.Y. & C. Gas C.	"	50				Chartiers Val.	"	100	9½	10½	
MINING:						Manufacturers	"	100			
Ent'prise	Colo.	5				Peoples' Nat. Gas.	"	50			
Lustre	Mex.	10				Peoples' Pipeage	"	25	14⅛	14⅝	
Silverton	Colo.	10				Pennsylvania	"	50			
MISCELLANEOUS:						Philadelphia	"	50	18¼	18⅝	
Carborundum	Pa.	100				Wheeling	W.V.	50			

* Official quotations Pittsburg Stock Exchange.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares.		Assessments.				Dividends.			
				No.	Par Val	Total Levied.	Date and Amount of Last.			Total Paid.	Date and Amount of Last.		
1	Adams, s. l. c.	Colo..	$1,500,000	150,000	$10	*				$693,500	Oct...	1895	.04
2	Ætna Cons., q	Cal ..	500,000	100,000	5	*				90,000	Mar..	1897	.10
3	Alaska-Mexican, g.	Alask	1,000,000	200,000	5					191,031	Jan ..	1897	.10
4	Alaska-Treadwell, g.	Alask	5,000,000	200,000	25	*				3,100,000	Jan ..	1897	.37½
5	Anaconda Copper	Mont.	30,000,000	1,200,000	25					2,250,000	Nov..	1896	1.25
6	Anchoria-Leland, g.	Colo..	600,000	600,000	1	*				48,000	Mar..	1897	.01
7	Argentum Juniata, g.s.l	Colo..	2,600,000	1,300,000	2	*				39,000	July..	1895	.03
8	Aspen Mg. & S., s. l.	Colo..	2,000,000	200,000	10	*				900,000	July..	1894	.10
9	Atlantic, c.	Mich.	1,000,000	40,000	25					740,000	Feb..	1897	1.00
10	Aurora, i.	Mich.	2,500,000	100,000	25	*				700,000	April.	1896	.50
11	Bald Butte	Mont.	250,000	250,000	1	*				475,000	Feb..	1897	.02
12	Bangkok-Cora Bell, s. l.	Colo..	600,000	600,000	1					107,510	July..	1896	.01
13	Bates Hunter, g. s.	Colo..	1,000,000	1,000,000	1	*				67,500	Dec..	1891	.00¾
14	Belden, F. E., m.	N. H.	500,000	100,000	5	*				217,000	Jan ..	1896	.04
15	Big Six, g. s.	Colo..	500,000	500,000	1					2,500	May..	1896	.00½
16	Bi-Metallic, g. s.	Mont.	5,000,000	200,000	25	*				1,630,000	June.	1893	.10
17	Boston & M. Cons., g.s.c	Mont.	3,750,000	150,000	25	*				5,825,000	May..	1897	3.00
18	Brotherton, i.	Mich.	2,000,000	80,000	25	*				120,000	Mar..	1893	.50
19	Bullion, Beck & Champ.	Utah.	1,000,000	100,000	10	*				2,117,000	Mar..	1897	.50
20	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25					48,850,000	April.	1897	5.00
21	Cariboo	B.C..	800,000	800,000	1					140,965	Mar..	1897	.02
22	Centen'l-Eureka, g.s.l.c	Utah.	1,500,000	30,000	50	30,000	Mar..	1889	1.00	1,950,000	Mar..	1897	1.00
23	Central, c.	Mich.	500,000	20,000	25	100,000	Oct...	1861	.65	1,970,000	Feb..	1891	1.00
24	Charleston, p. r.	S. C..	1,000,000	10,000	100	*				150,000	Feb..	1897	1.00
25	Clay County, g. s. c.	Colo..	60,000	60,000	1	*				52,000	Nov..	1891	.02
26	C. O. D., g.	Colo..	500,000	500,000	1	*				25,000	Mar..	1896	.01
27	Cœur d'Alene, s. l.	Idaho	5,000,000	500,000	10					340,000	June.	1893	.06
28	‡Cons. Cal. & Va., g. s.	Nev..	21,600,000	216,000	100	5,014,130	April.	1897	.25	3,898,800	Feb..	1895	.25
29	Cons. New York, g. s.	Nev..	10,000,000	100,000	100	168,000	Jan ..	1896	.05	10,000	Feb..	1893	.10
30	Coptis, g. s.	Nev..	10,000,000	100,000	100					77,000	Feb..	1895	.01
31	Cortez, Ltd., s. g.	Nev..	1,500,000	300,000	5					735,000	Feb..	1893	.15
32	Dalton & Lark, s. l.	Utah.	2,500,000	2,500,000	1					87,500	Aug..	1896	.00½
33	Daly, s. l.	Utah.	3,000,000	150,000	20					2,925,000	Mar..	1897	.25
34	†Deadwood-Terra, g.	S. D..	5,000,000	200,000	25	*				1,240,000	Aug..	1896	.50
35	De Lamar, g. s.	Idaho	2,000,000	400,000	5	*				2,250,000	Oct...	1896	.25
36	Derbec Blue Gravel, g.	Cal ..	10,000,000	100,000	100	110,000	June.	1893	.10	280,000	Aug..	1891	.10
37	Dexter, g. s.	Nev..	1,000,000	100,000	10	8,000	June.	1892	.08	100,000	Aug..	1893	.33
38	Elkhorn, s.	Mont.	1,000,000	200,000	5					1,212,000	June.	1895	.06
39	Elkton Cons., g.	Colo..	1,250,000	1,250,000	1					231,960	Mar..	1897	.02
40	Enterprise, g. s.	Colo..	2,500,000	500,000	5	*				825,000	May .	1893	.25
41	Eureka Cons., g. s. l.	Nev..	1,000,000	50,000	20	567,500	Feb..	1897	.25	5,112,500	Jan..	1892	.25
42	Evening Star, s. l.	Colo..	500,000	50,000	10	*				1,437,500	Dec..	1889	.25
43	Florence, s.	Mont.	2,500,000	500,000	5	*				125,318	Mar..	1897	.01
44	Franklin, c.	Mich.	1,000,000	40,000	25					1,240,000	Jan..	1894	2.00
45	Galena, g. s. l.	Utah.	1,000,000	100,000	10					71,000	Jan..	1897	.05
46	Garfield-Grouse, g.	Colo..	1,200,000	1,200,000	1	*				24,000	Dec..	1896	.01
47	Gold Coin, g. s.	Colo..	1,000,000	200,000	5	*				120,000	Feb..	1897	.10
48	Golden Eagle, g.	Colo..	1,000,000	1,000,000	1	*				10,000	Sept..	1896	.01
49	Golden Fleece, g. s.	Colo..	600,000	600,000	1	*				569,179	Feb..	1897	.01
50	Gold & Globe, g.	Colo..	750,000	750,000	1					36,000	Aug..	1896	.00 3/16
51	Gold Rock, g. s. c.	Colo..	500,000	500,000	1	*				28,750	Dec..	1891	.01
52	Granite Mountain, g. s.	Mont.	10,000,000	400,000	25	*				12,120,000	July..	1892	.20
53	Granite, s. l.	Idaho	500,000	200,000	2.50	*				83,400	Nov..	1890	.10
54	Gt. West'n Quicksilv., q.	Cal ..	5,000,000	50,000	100					388,366	Nov..	1893	.10
55	Harquahala, g.	Ariz..	1,500,000	300,000	5					126,000	Nov..	1894	.12
56	Hecla Cons., g. s. c. l.	Mont.	1,500,000	30,000	50	*				2,175,000	Feb..	1897	.50
57	Helena & Frisco, s. l.	Idaho	2,500,000	500,000	5	*				475,000	Aug..	1896	.04
58	Holmes, s.	Nev..	10,000,000	100,000	100	345,000	Mar..	1890	.25	75,000	April.	1892	.25
59	Homestake, g.	S. D..	12,500,000	125,000	100	200,000	July..	1878	1.00	6,181,250	Mar..	1897	.25
60	Hope, s.	Mont.	1,000,000	100,000	10	*				672,252	Mar..	1897	.10
61	Horn-Silver, g. s. c. sp. l.	Utah.	10,000,000	400,000	25	*				5,130,000	Jan..	1896	.12½
62	Iowa	Colo..	1,000,000	1,000,000	1					65,000	Feb..	1897	.00½
63	Iron Mountain, s. l.	Mont.	5,000,000	500,000	10	*				492,500	Nov..	1896	.06
64	Iron Silver, s. l.	Colo..	10,000,000	500,000	20	*				2,500,000	April.	1889	.20
65	Isabella, g.	Colo..	2,250,000	2,250,000	1					258,750	Mar..	1897	.02½
66	Jack Rabbit, g.	Cal ..	10,000,000	100,000	100	118,000	April.	1894	.02	260,000	April.	1891	.10
67	Jay Hawk, g.	Mont.	1,425,000	285,000	5					33,375	Dec..	1892	.12
68	Kearsarge, c.	Mich.	1,000,000	40,000	25	190,000	Oct...	1887	1.00	120,000	Dec..	1895	1.00
69	Kennedy, g.	Cal ..	10,000,000	100,000	100					1,796,000	Aug..	1895	.48
70	Leadville Cons., s. l.	Colo..	4,000,000	400,000	10	*				316,000	Feb..	1893	.03
71	Little Chief, s. l. i-o.	Colo..	10,000,000	200,000	50	*				820,000	Dec..	1890	.05
72	Maid of Erin, g. s. c. l.	Colo..	3,000,000	600,000	5	*				740,000	Nov..	1895	.02
73	Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	*				1,150,000	Nov..	1896	.05
74	Mayflower Gravel, g.	Cal ..	1,200,000	60,000	20					166,897	Dec..	1895	.10
75	May-Mazeppa Con., l. s.	Colo..	1,000,000	1,000,000	1	*				170,000	Oct...	1891	.03¾
76	Mercur, g.	Utah.	5,000,000	200,000	25	*				650,000	Mar..	1897	.12½
77	Minnesota Iron, i.	Minn.	16,500,000	165,000	100	*				3,240,009	July..	1896	1.50
78	Mollie Gibson, s.	Colo..	5,000,000	1,000,000	5	20,000	Jan..	1891	.02	4,080,000	Jan..	1895	.05
79	Monitor, g.	S. D..	2,500,000	250,000	10					45,000	Oct...	1890	.03
80	Montana, Ltd., g. s.	Mont.	3,300,000	660,000	5	*				2,890,637	Oct...	1895	.06¼
81	Montana Ore Purchas'g	Mont.	1,000,000	40,000	25	*				560,000	April.	1897	1.00
82	Moon Anchor Gold	......	600,000	600,000	1	*				24,000	July..	1896	.01
83	Moose, g.	Colo..	600,000	600,000	1					186,000	Jan..	1896	.01
84	Morning Star Cons., s. l.	Colo..	1,000,000	100,000	10	*				1,025,000	Dec..	1891	.25
85	Mt. Diablo, s.	Nev..	5,000,000	50,000	100	145,000	Nov..	1896	.10	225,000	Aug..	1893	.25
86	Mt. McClellan, g. s. l.	Colo..	1,250,000	250,000	5	*				21,936	June.	1891	.03
87	Mt. Rosa, g.	Colo..	1,000,000	1,000,000	1					30,000	Oct...	1896	.00½
88	Napa, q.	Cal ..	700,000	100,000	7	*				830,000	April.	1897	.10
89	New Elkhorn	Colo..	1,500,000	300,000	5					72,000	Sept..	1896	.24
90	New Guston, g. s. c.	Colo..	550,000	110,000	5	*				1,198,120	Oct...	1892	.25
91	New Hoover Hill, g.	N. C..	300,000	120,000	2.50	*				22,500	Dec..	1885	.20
92	N.Y.&Hon.Rosario, s.g.	C. A..	1,500,000	150,000	10	*				727,500	Mar..	1897	.10
93	North Banner, g. s.	Cal ..	1,000,000	100,000	10	21,794	Oct...	1896	.02	20,000	July..	1891	.05
94	North Com'wealth, s.	Nev..	10,000,000	100,000	100	85,000	April.	1890	.25	25,000	June.	1891	.25
95	North Star, g.	Cal ..	2,000,000	200,000	10	20,000	June.	1885	.02	450,000	June.	1893	.50
96	Nugget, g.	Colo..	1,000,000	1,000,000	1	*				10,000	Jan..	1895	.00½
97	Ontario, s. l.	Utah.	15,000,000	150,000	100					13,400,000	Mar..	1897	.10
98	Osceola, c.	Mich.	1,250,000	50,000	25	*				2,122,500	Feb..	1897	1.00
99	Pacific Coast Borax, b.	Cal ..	2,000,000	20,000	100					422,500	July..	1893	1.00
100	Parrot, c.	Mont.	2,300,000	230,000	10	*				1,622,215	June.	1894	.05
101	Petro, s.	Utah.	1,000,000	10,000	100					17,500	July..	1891	.75
102	Pharmacist, g.	Colo..	1,200,000	1,200,000	1					80,000	Jan..	1893	.01
103	Portland, g.	Colo..	3,000,000	3,000,000	1	*				953,000	Mar..	1897	.01
104	Quicksilver, pref., q.	Cal ..	4,300,000	43,000	100	*				1,823,911	June.	1891	1.25
105	" com., q.	Cal ..	5,700,000	57,000	100	*				643,867	July..	1882	.40
106	¶Quincy, c.	Mich.	2,500,000	100,000	25	*				9,070,000	Feb..	1897	8.00
107	Reed National, s.	Colo..	500,000	500,000	1	*				45,000	Dec..	1890	.01
108	Robinson Cons., s. l.	Colo..	10,000,000	200,000	50	*				585,000	Mar..	1886	.05
109	Running Lode, g. s. l.	Colo..	1,000,000	1,000,000	1	*				27,000	June.	1893	.00 1/10
110	St. Joseph, l.	Mo...	2,500,000	250,000	10					2,524,000	Dec..	1895	.25
111	Silent Friend, g. s. l.	Colo..	500,000	500,000	1	*				60,000	Aug..	1891	.25
112	Silver King, s.	Ariz..	10,000,000	100,000	100	272,858	Mar..	1897	.25	1,950,000	July..	1887	.25
113	Silver King, g. s. l.	Utah.	3,000,000	150,000	20	3,000	Jan..	1897	.02	975,000	Mar..	1897	.25
114	Silver Mg. of L. V., s.	N. M.	500,000	500,000	1	*				300,137	Dec..	1891	.04
115	Small Hopes, s.	Colo..	5,000,000	250,000	20	*				3,275,000	Mar..	1896	.10
116	‖Smuggler Union, g. s.	Colo..	5,000,000	50,000	100					150,000	Oct...	1896	1.00
117	§Standard Cons., g. s.	Cal ..	20,000,000	200,000	100					3,737,868	Mar..	1897	.10
118	Swansea, g. s. l.	Colo..	600,000	60,000	10	*				39,000	Sept..	1892	.10
119	Tamarack, c.	Mich.	1,250,000	50,000	25					4,770,000	Dec..	1896	3.00
120	Teal & Poe, s. l.	N. M.	150,000	150,000	1	*				9,000	Nov..	1891	.01½
121	Tom Boy, g.	Colo..	2,000,000	200,000	10	*				410,000	Mar..	1896	.20
122	Trinity River, g.	Cal ..	500,000	500,000	1	*				15,000	July..	1893	.00½
123	United Verde, c.	Ariz..	3,000,000	300,000	10	*				562,500	Dec..	1893	.25
124	Union, g.	Colo..	1,250,000	1,250,000	1					73,000	June.	1896	.01
125	Union Leasing	Colo..	500,000	500,000	1					340,000	July..	1895	.04
126	Utah	Utah.	1,000,000	100,000	10	*				175,000	Feb..	1897	.02
127	Victor, g.	Colo..	1,000,000	200,000	5	*				765,000	Mar..	1897	.10
128	War Eagle	B.C..	500,000	500,000	1	32,500	Dec..	1894		187,000	Oct...	1896	.06
129	Woodside	Utah.	1,000,000	100,000	10					25,000	Oct...	1889	.25
130	Yankee Girl, s.	Colo..	1,300,000	260,000	5					520,000	July..	1891	.25

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares.		Assessments.			
				No.	Par Val	Total Levied.	Date and Amount of Last.		
1	Ada Cons., s. l.	Utah.	$100,000	100,000	$1	$3,333	Nov..	1895	.01½
2	Ajax, g	Colo..	1,000,000	1,000,000	1				
3	Alamo, g.	Colo..	1,000,000	1,000,000	1				
4	Alice, g. s. c.	Colo..	5,000,000	5,000,000	1	*			
5	Alliance, g. s. l.	Utah.	100,000	100,000	1	200,000	Dec..	1895	.10
6	Allouez, c.	Mich.	2,000,000	80,000	25	1,440,937	June.	1894	.20
7	Alpha Cons., g. s.	Nev..	10,500,000	105,000	100	262,750	April.	1897	.05
8	Alta, s.	Nev..	10,080,000	108,000	100	3,595,960	April.	1897	.05
9	American, c.	Idaho	5,000,000	500,000	10	*			
10	American Belle, g.s.c.	Colo..	2,000,000	400,000	5	*			
11	Anaconda, g.	Colo..	5,000,000	1,000,000	5				
12	Anchor, g. s. l.	Utah.	1,500,000	150,000	10	560,000	Aug..	1893	.20
13	Aola, g.	Colo..	1,000,000	1,000,000	1	*			
14	Argonaut Cons., g. s,	Colo..	1,000,000	1,000,000	1	*			
15	Atlantic Cable Cons.	Colo..	1,500,000	1,500,000	1	*			
16	Bahama, g.	S. D..	1,250,000	250,000	5	3,125	Sept..	1893	.00¼
17	Bankers, g.	Colo..	1,250,000	1,250,000	1	*			
18	Belcher, s. g.	Nev..	10,400,000	104,000	100	3,338,420	April.	1897	.25
19	Belle Isle	Nev..	10,000,000	100,000	100	240,271	July..	1896	.10
20	Ben Hur, g.	Colo..	900,000	900,000	1				
21	Blue Bell, g.	Colo..	500,000	500,000	1	*			
22	Blue Jay Cons., s. l.	Utah.	2,000,000	400,000	5	4,750	July..	1893	.004
23	Bob Lee, g.	Colo..	1,200,000	1,200,000	1	*			
24	Bullion, s. g.	Nev..	1,000,000	100,000	100	3,040,000	Feb..	1897	.10
25	Bunker Hill & S., s. l.	Idaho	3,000,000	300,000	10				
26	Burlington, g. s.	Cal...	10,000,000	100,000	100	3,000	May..	1896	.03
27	Buskhorn, g.	Colo..	900,000	900,000	1				
28	Butte Queen, g.	Cal...	1,000,000	100,000	10	16,000	Feb..	1893	.10
29	Calumet, g.	Colo..	1,400,000	1,400,000	1	*			
30	Central Lead, l.	Mo...	400,000	4,000	100	*			
31	Central North Star, g.	Cal...	1,000,000	100,000	10	10,000	July..	1893	.10
32	Challenge, s, g.	Nev..	5,000,000	50,000	100	300 000	Nov..	1896	.10
33	Chollar, g. s	Nev..	11,200,000	112,000	100	2,021,600	July..	1896	.25
34	Chrysolite, s. l.	Colo..	10,000,000	200,000	50	*			
35	Cleveland Cliffs, l.	Mich.	5,000,000	50,000	100	*			
36	Columbine, g.	Colo..	1,000,000	1,000,000	1	*			
37	Confidence, g. s.	Nev..	2,496,000	24,960	100	1,636,974	Sept..	1896	.30
38	Cons. Imperial, g. s.	Nev..	5,000,000	50,000	100	2,082,500	Mar..	1897	.01
39	Copper Mountain, g.	Colo.	1,000,000	1,000,000	1	*			
40	Creede & C. C., g.	Colo..	800,000	800,000	1				
41	CrippleCreekCons., g.	Colo..	2,000,000	2,000,000	1				
42	Crip.Cr'kGoldExpl'n	Colo..	1,800,000	1,800,000	1				
43	Dante, g.	Colo..	1,250,000	1,250,000	1	*			
44	Denver City, s.	Colo..	5,000,000	500,000	10	*			
45	Denver Gold, g.	Colo..	300,000	60,000	5				
46	Dickens-Custer, g. s.	Colo..	2,100,000	420,000	5				
47	Enterprise, g.	Colo..	800,000	800,000	1				
48	Eureka Con. Drift, g.	Cal...	500,000	500,000	1	115,000	Feb..	1897	.05
49	Exchequer, g. s.	Nev..	10,000,000	100,000	100	725,000	Dec..	1896	.05
50	Favorite, g.	Colo..	1,200,000	1,200,000	1	*			
51	Fortunatus, g. s.	Colo..	100,000	100,000	1	*			
52	Found Treasure, g. s.	Nev..	10,000,000	100,000	100	55,770	Jan..	1892	.50
53	Franklin Gold, g.	Colo..	1,000,000	1,000,000	1	*			
54	Free Coinage, g.	Colo..	1,000,000	1,000,000	1	*			
55	Galena, l. s.	Idaho	500,000	500,000	1				
56	Garden City, g.	S. D..	2,500,000	250,000	10	2,898	Sept..	1891	.001½
57	Gem, g.	Cal...	10,000,000	100,000	100				
58	Gold Belt, g. s.	Utah.	500,000	500,000	1	3,012	July..	1896	.00½
59	Golden Age, g.	Colo..	1,000,000	1,000,000	1	*			
60	Golden Dale, g.	Colo..	2,000,000	2,000,000	1	*			
61	Golden Fleece Grav. g	Cal...	130,000	130	1000	56,260	Mar..	1897	2.00
62	Gold Flat, g.	Cal...	1,000,000	100,000	10	13,000	Aug..	1893	.03
63	Gold King, g.	Colo..	1,000,000	1,000,000	1	*			
64	Gold Rock, g.	Colo..	1,000,000	1,000,000	1	*			
65	Gold Standard, g.	Colo..	1,000,000	1,000,000	1	*			
66	Gould & Curry	Nev..	10,800,000	108,000	100	4,850,400	Jan..	1897	.15
67	Hale & Norcross, g. s.	Nev..	11,200,000	112,000	100	5,798,000	April.	1897	.10
68	Hartshorn, g. s.	S. D..	1,250,000	250,000	5	8,750	Sept..	1891	.00½
69	Head Cent. & Tr., g.s.	Ariz..	2,000,000	200,000	10	22,824	Mar..	1892	.03
70	Hidden Treas., g. s.	Cal...	20,000	20,000	1	1,000	Nov..	1893	.05
71	Himalaya, s. l.	Utah.	1,800,000	180,000	10	10,000	Oct..	1892	.01
72	Idaho Co., Ltd., g.	Idaho	100,000	1,000	100	*			
73	Idlewild, g.	Cal...	1,000,000	100,000	10	*			
74	Inez, s. l.	Idaho	1,000,000	1,000,000	1	*			
75	Jack Pot, g.	Colo..	1,250,000	1,250,000	1				
76	Jackson, l.	Mich.	300,000	12,000	25	*			
77	Justice, g. s. c.	Colo..	500,000	500,000	1	*			
78	Keystone, g.	Colo..	1,500,000	1,500,000	1	*			
79	Kingman Silver, g. s.	Ariz..	10,000,000	100,000	100	5,000	Sept..	1891	.05
80	Lacrosse, g.	Colo.,	1,000,000	100,000	10	*			
81	Lottie Gibson, g.	Colo..	1,000,000	1,000,000	1				
82	Matoa, g.	Colo..	5,000,000	1,000,000	5				
83	Mayflower, g	Colo..	1,000,000	1,000,000	1	*			
84	Mexican, g. s.	Nev..	10,080,000	100,800	100	3,104,240	April.	1897	.20
85	Michigan Gold, g. s.	Mich.	2,500,000	100,000	25	40,000	Mar..	1892	.10
86	Milwaukee, s. l.	Idaho	500,000	500,000	1				
87	Modoc Chief, g. s. l.	Idaho	1,000,000	200,000	5	4,375	Jan..	1892	.00½
88	Monarch, g.	Colo..	1,000,000	1,000,000	1				
89	Mutual, g.	Colo..	500,000	500,000	1				
90	Neath, g.	Colo .	1,000,000	100,000	10				
91	New Gold Hill	N. C..	1,750,000	350,000	5				
92	New Viola, s. l.	Idaho	750,000	150,000	5	*			
93	North Belle Isle, s.	Nev..	10,000,000	100,000	100	523,074	July..	1896	.10
94	Occidental Cons., g.s.	Nev..	10,000,000	100,000	100	463,652	Mar..	1897	.10
95	Original Keystone, s.	Nev..	10,000,000	100,000	100	250,000	Mar..	1892	.10
96	Oro Cache, g. s	S. D..	1,250,000	250,000	5	6,250	July..	1893	.00½
97	Orphal Bell, g.	Colo..	1,000,000	1,000,000	1				
98	Overman Silver, g. s.	Nev..	1,152,000	115,200	100	4,188,560	Dec..	1896	.10
99	Pappoose, g.	Colo..	2,000,000	2,000,000	1	*			
100	Peer, s.	Ariz..	10,000,000	100,000	100	215,000	July..	1894	.05
101	Peerless, s.	Nev..	10,000,000	100,000	100	410,000	July..	1894	.05
102	Pine Hill, g.	Cal ..	1,000,000	100,000	10	25,000	Jan ..	1897	.05
103	Pioche Con., g. s. l.	Nev..	20,000,000	2,000,000	10	*			
104	Potosi, g. s.	Nev..	11,200,000	112,000	100	2,044,000	April.	1897	.20
105	Princess, g.	Colo..	1,000,000	1,000,000	1				
106	Puritan, g, s.	Colo..	1,500,000	150,000	10	*			
107	Quincy, c.	Colo..	3,000,000	300,000	10				
108	Red Mountain, s.	Colo..	300,000	60,000	5	22,500	Mar..	1891	.12½
109	Ruby & Dun., g. s. l.	Nev..	25,300	506	25	*			
110	St. Mary, c.	Mich.	1,000,000	40,000	25	4,000	July..	1895	.05
111	Savage, g. s	Nev..	11,200,000	112,000	100	1,051,400	Jan..	1897	.20
112	Seg. Belcher & M., g.s.	Nev..	10,000,000	100,000	100	340,000	Nov..	1896	.10
113	Silver Age, g. s. l.	Colo..	2,000,000	200,000	10	*			
114	Silver Hill, s.	Nev..	10,800,000	108,000	100	1,992,600	July..	1894	.05
115	Silver Queen, c.	Ariz..	5,000,000	200,000	25	*			
116	Silver State, g.	Colo..	700,000	700,000	1	*			
117	Siskiyou Con., s.	Cal ..	2,000,000	200,000	10	44,000	June.	1896	.01
118	Specimen, g.	Colo..	1,200,000	1,200,000	1				
119	Temonj, g.	Colo..	1,000,000	1,000,000	1				
120	Tombstone, g. s. l.	Ariz..	12,500,000	500,000	25	*			
121	Tornado Con., g. s.	Nev..	100,000	100,000	1	*			
122	Union Con., g. s	Nev..	10,000,000	100,000	100	2,545,000	Sept..	1896	.20
123	Utah Cons., s.	Nev..	10,000,000	100,000	100	420,722	Feb..	1897	.05
124	Victory, g. s.	S. D..	1,250,000	250,000	5	2,625	Nov..	1896	.001½
125	Virginia M. Cons., g.	Colo..	1,000,000	1,000,000	1				
126	Waterloo, g.	Cal...	2,000,000	200,000	10	30,000	Aug..	1893	.15
127	West Granite Mt., s.	Mont.	500,000	100,000	5				
128	Whale, g. s. l.	Colo..	500,000	500,000	1	*			
129	Work, g.	Colo..	1,250,000	1,250,000	1				
130	World, g.	Colo..	1,500,000	1,500,000	1	*			

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 $31,320,000 in dividends and the Cons. Virginia $42,390,000. ‖ Dividends paid since consolidation.
§ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. ¶ Scrip converted into stock April 16.
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.