

ENGINEERING and MINING JOURNAL.

VOL. XXVI., No. 12.

RICHARD P. BOWEN, C. E., M. E., } Editors.
ROSSITER W. RAYMOND, Ph. D., }

Gen. FRANCOIS L. VINTON M. E., Superintendent of Western Office.

NOTE.—Communications relative to the editorial management should be addressed to Mr. BOWEN, P. O. Box 4404, New York. Articles written by Mr. RAYMOND will be signed thus *.

Business communications for the Western Department should be addressed to the Western Office at Denver, Colo.

THE SCIENTIFIC PUBLISHING CO., PUBLISHERS,
27 Park Place, New York.

CONTENTS.

EDITORIALS:	PAGE.	PAGE.	
Russia Sheet-Iron and How it is Made.....	199	Making Gems.....	207
New Publications.....	199	Prospects of Increase of Gold Production in Chili.....	207
Monthly Mine Reports.....	200	Meeting of the International Union.....	207
Books Received.....	201	New Applications of the Electric Light.....	207
Electro-Refining of Lead.....	201	The Color of Metallic Films.....	207
Oestlund Mechanical Puddler in Sweden.....	202	To Drill Glass.....	207
Russia Sheet-Iron.....	203	Colorado Agates.....	207
Nevada and California Mines.....	204	Protecting Iron from Rust.....	208
Quick-Speed Hand-Drill.....	204	PROPOSALS.....	209
Gas-Engines.....	204	STATISTICS OF COAL PRODUCTION.....	209
British Columbia Coal Fields.....	206	COAL TRADE REVIEW.....	209
New Patents.....	206	FREIGHTS.....	211
Colorado Coal Mines.....	206	IRON MARKET REVIEW.....	211
Hydraulic Salt-Mining in Bavaria.....	206	METALS.....	212
Georgia Gold Fields.....	206	FINANCIAL:	
Petroleum Notes.....	208	New York Stocks.....	213
Mining News.....	206	Miscellaneous Stocks and Quotations.....	213
NOTES:		Philadelphia Stocks.....	215
The Telephone in the Field.....	201	Gas Stocks.....	215
Wood Pavements in London.....	202	Copper Stocks.....	215
The Annual Production of the Sugar of the World.....	206	Gold and Silver Stocks.....	215
Utilizing Solar Heat in Algeria.....	207	Advertisers' Index.....	216

NOTICE.

THEODORE F. VAN WAGENEN, of Denver, Colo., is no longer connected with the ENGINEERING AND MINING JOURNAL or the Scientific Publishing Company, and is not authorized to collect moneys or transact any business whatever for the same.

RUSSIA SHEET-IRON, AND HOW IT IS MADE.

In another column will be found a breezy correspondence on this subject, which is attracting not a little attention in the trade. While we are very far from wishing to disparage American products, or to unduly praise foreign manufactures, we think the expressions used by "our valued contemporary," the *Iron Age*, are somewhat wild as to the facts as well as a trifle discourteous to its correspondents.

We gladly recognize the great measure of success which has attended the meritorious efforts of an enterprising Pittsburg firm, that has, since 1873, been manufacturing planished or "imitation Russia" sheet-iron; yet we know that a large number of consumers—we think the great majority in certain classes—assert most positively that we are yet behind the Muscovite in this particular branch of industry. The general complaint is, that the "planished or imitation Russia" iron rusts more easily than the genuine article, and that it is scarcely as soft and easily worked. The denying of the facts, and excitedly calling them "unfair misstatements" and "absolutely false," to say nothing of the refusal to publish the opposing opinions of those who have used both kinds of iron, and the frantic appeal to patriotism to settle a simple question of quality, betrays a degree of anxiety as to the result of discussion which has a tendency to injure the cause of American planished iron with thoughtful readers.

There can be no question of the excellent quality of the American article, and that for many purposes it can with advantage take the place of the imported sheets; and if its price were lower, which it no doubt could be made and yet afford a fair profit to the manufacturer, it would have a still more extended application. It is equally certain that for certain uses the foreign iron is still preferred, notwithstanding its higher price, and it would seem quite natural to assume that the increased demand for it, which has been noticeable this year, is due to a recognition of this superiority for certain uses; the price being constantly in favor of the American article.

We have, however, no doubt but that our invincible American ingenuity will find the means for making a planished iron in every respect equal, no, superior, to that which has so long held the markets of the world.

For a long time the method of manufacture of Russia sheet-iron was held as a secret, and though this leaked out many years ago, so far as the general principles involved were concerned, yet there were details of manipulation which resisted the ingenuity of manufacturers, and which could not be reproduced by the use of machinery infinitely superior to the crude appliances by which the genuine Russia sheet is manufactured.

Since many persons still think the method of manufacture a mystery, a description of it will be of interest to many of our readers.

Prof. S. JORDAN, of the Ecole Centrale, in Paris, who is also President of the Institution of Civil Engineers in France, and one of the leading authorities on iron and steel, gives, in his report on the iron industry at the Paris Exposition in 1867, some details of the manufacture of Russia sheet-iron, which, he says, were furnished to him by M. KOULIBINE, a Russian engineer:

These polished sheets are manufactured from charcoal iron, produced in finery fires and brought into the form of blooms about one inch thick. These blooms are heated to cherry heat and rolled into leaves. Each of these leaves is cut into pieces corresponding to the weight of the sheets which are to be manufactured, and these pieces are piled upon one another and rolled together until the desired degree of thinness is attained. Thus the black sheets are manufactured. To transform these into polished sheets, a certain number at a time are heated to red heat and piled one upon another, a black impalpable powder, which is simply pulverized charcoal, being sprinkled between each two sheets. The bottom and the cover of each packet of sheets thus piled for polishing are formed by two sheets of greater thickness. This packet is then hammered, for the purpose of reducing the sheets still further in thickness, under a hammer, the head of which weighs from 1000 to 1100 kilograms (say 2200 to 2400 pounds). For giving polish and luster, the sheets, now almost cold, are brought under a second hammer with a large face, rounded at the edges and of the same weight.

Finally, they are allowed to cool completely, and are then clipped and classified into three classes, according to the perfection of their polish. The sheets of the first class ought to be like a mirror, without a spot upon their surface. The action of charcoal projected upon the red-hot surfaces, and inclosed between them without access of air, may be easily understood. It cements, and thus enables them to take a high polish, while rendering them at the same time less liable to rust. This cementation once having taken place, the sheet should not afterward be returned to the heating furnace.

Whether the non-oxidizable quality is due to a carburization of the surface by cementation or by an oxidation which has been supposed to take place in the somewhat tedious process of manufacture, is not yet fully decided. The high quality of the iron used by the Russians has no doubt much to do with the merited popularity their final product enjoys. In the same category is the fact that, while we make most excellent wire from our own iron, we have not yet been able to produce an article quite equal to the Swedish rods for certain purposes. We have no doubt but that in time the American product, or "imitation Russia," which is now perfectly adapted to many uses, will eventually be made equal in all respects to the genuine Russian, and exclude it from our markets; but this result will be accomplished by greater care and skill in manufacture rather than by denunciation of those who hold that some improvement has yet to be made, or by appeals to patriotism.

NEW PUBLICATIONS.

DIE PETROLEUM-INDUSTRIE NORDAMERIKAS, ETC. (*The Petroleum Industry of North America, in its Historical, Economical, Geological, and Technical Relations.*) By Prof. HANNS HÖFER. Vienna. 1878.

DIE KOHLEN-UND EISENERZ-LAGERSTÄTTEN NORDAMERIKAS, ETC. (*The Coal and Iron-Ore Deposits of North America, their Occurrence and their Economical Significance.*) By Prof. HANNS HÖFER. Vienna. 1878.

These two reports constitute respectively the eighth and the twenty-third volumes of the series issued by the Austrian Commission for the International Exhibition at Philadelphia. The high reputation of Prof. HÖFER warranted us in expecting that his survey of our resources and industries would be intelligent and comprehensive. It is precisely in such hasty and extensive examinations that the skill of the trained observer and the power of generalization possessed by the experienced student are most imperatively required and most clearly shown. We are not disappointed in this expectation by the volumes before us. While they contain little that would be new to American readers, they present a mass of information, recent, trustworthy, and well arranged, which it would not be easy to find in any two books of a similar kind in our own literature.

The most important passages to us, however, are those in which the distinguished author utters his own opinions. These, we regret to say, are few. The more eminent and thorough an expert is, the less likely is he to volunteer his views on disputed subjects, after brief examination. Moreover, like all the distinguished savants who visited this country during the centennial year, Prof. HÖFER has considered it his business to learn, rather than to teach; and his report is intended to enlighten his own countrymen, not to instruct ours.

We notice that he is, however, pretty positive as to the theory of the origin of petroleum. Speaking of the hypothesis of LESQUEUREUX and others, who refer it to marine plants, he says (p. 88): "It is possible that such remains of a marine flora may have cooperated in the formation of oil, although, indeed, we know of no bituminous fucoidal slates. We

will not deny the possibility of such an agency; yet it appears to us that from the present stand-point of science animal remains only can be safely assumed as a basis to explain the genesis of petroleum."

We translate also (condensing slightly) as an excellent summary of conclusions, the following (p. 80-82):

"1. All petroleum-deposits of Eastern North America are paleozoic.
"2. They do not lie in the same geological horizon, or even in the same geological group.

"3. The oldest are in the lower Silurian Trenton groups (Manitoulin Island and other points in Canada). The next above these—not counting the bituminous Niagara limestone of Chicago—belong to the lower Helderberg and Oriskany (Gaspé Bay). The Corniferous limestone of the Devonian carries oil at Enniskillen, Canada, where it is the lowest paying stratum. The Genesee slates on the upper edge of the Hamilton group carry up to 15 per cent bitumen. These are the seat of most of the gas-wells in North Pennsylvania and Ohio, but do not furnish oil in noteworthy amount. The overlying Chemung group carries the oil-deposits which form the present basis of the Pennsylvania industry. Even up to the bottom of the productive coal measures, oil can be traced; but above that line there are no petroleum-bearing strata worth mentioning.

"4. A portion of the deposits shows the oil in definite conformable strata (Pennsylvania, and Canada to some extent); another portion carries oil in fissures (Ohio, West Virginia).

"5. In the former case, it chiefly is the porous rocks (conglomerates, coarse sandstones, cavernous limestones) that carry oil. Clay slates have been found at single localities to contain it; but they are, in the most favorable cases, far less productive.

"6. In Canada, Ohio, and West Virginia, it is beyond doubt that the main quantity of oil is accumulated along the backs of anticlinals, which are often so gentle in slope that their existence can be established by accurate instrumental survey only. For Pennsylvania, a similar statement is probably true, for reasons to be explained hereafter. The anticlinals are therefore the surest guide for explorations. Experience has shown that the gently-arched ones carry the largest quantities of oil, while the violent folds of the same formations in the Alleghany Mountains show but scattered traces of oil.

"7. Within one and the same oil region, carrying oil in strata, the oil-bearing rock is not everywhere found at the same depth or of the same age.

"8. Where oil occurs in fissures, it is not controlled by the nature of the rock, nor bound to any particular formation. The fissures are usually on the backs of anticlinals.

"9. The various oil regions of Pennsylvania, Ohio, West Virginia, Kentucky, and Tennessee lie west of the Alleghanies and parallel with that range.

"Concerning the latter statement and that made under No. 6 above, the following theoretical considerations may find place. We have noted already the very regular distribution of the oil-districts in the upper Pennsylvania region, from Wartenburg, Smith's Ferry, and Noble County, Ohio, for a distance of 200 miles in a straight line N. 36° E. We have also shown that the main axis of the lower Pennsylvania region is parallel with this, and that the southwest continuation of this line strikes the most important oil region (Cow Run) of Ohio. That this is not a chance coincidence merely, a further fact will prove. About 65 miles east of this main axis of the upper oil region, and exactly parallel with it, rises Chestnut Ridge; and immediately east and parallel is Laurel Ridge. While the entire surrounding neighborhood belongs to the productive coal measures, these two waves of rock bring to the surface the subcarboniferous formation. They form the most westerly ridges of the Appalachian system, and appear on the geological maps as two straight, parallel bands, coursing exactly N. 36° E. This striking coincidence forces us to conclude that we have in the axes of the oil regions gentle anticlinals flanking and belonging to the Appalachian system."

There is then good reason for using the level, to aid in exploring for petroleum, though even geologists have ridiculed this idea as no better than a belief in the divining-rod; and the hypothesis of the "three oil-sandrocks" has been violently forced upon every occurrence. There can be no doubt that the gentle anticlinals form one of the most important guides to the discovery of productive oil-deposits. Only, to test this theory in Pennsylvania, let those valleys be selected which cross the course of the main anticlinals, that is, run northwest and southeast; and let it not be expected that every undulation of the strata, big or little, is sure evidence of an oil-region. Certainly this hint will be incomparably more useful in practice than the phantasies which have recently made their appearance, concerning the ocean-currents which are alleged to have deposited the oil-bearing sandstones and conglomerates of Pennsylvania.

We have left ourselves no space to notice at length the chapters on the refining of oil and its by-products (the latter by Mr. MAX ROTHAUER), or to comment upon the Coal and Iron-Ore Report, which gives a very complete picture of the resources of the United States in these respects. We notice that Mr. POSEPNY, who furnishes the chapter on Missouri, expresses the deliberate opinion that this State is the most richly supplied with iron ore of all the States of the Union, and prophesies a great future for it, by reason of this fact and also of its advantageous position on the borders of the great West, which is poor in iron, so far as discoveries have proved. Mr. POSEPNY seems to have ignored the magnificent specular ores of Wyoming; and his estimate of Missouri is, moreover, startling. But his word carries great weight; and Michigan, New Jersey, New York, and Tennessee must look to their laurels.

MONTHLY MINE REPORTS.

We have frequently urged upon the directors of companies the expediency, as well as the duty, of giving the public full and reliable information concerning the progress of work at the mines; and we have frequently stated that a management which neglects or refuses to make this information public is unworthy of confidence. Subsequent events have but too frequently confirmed the accuracy of this opinion. A full and honest statement every month, of the previous month's work and the results of explorations, would prove more attractive to investors than any rose-colored prospectus, and would be highly conducive to economy in management. It is surprising that directors of companies, usually so enterprising and eager to exploit every device having for its object the capture of the public confidence, should so studiously avoid the most successful of all,

namely, straightforward honesty in making stockholders and the public acquainted with the results of their venture.

The accompanying reports of the Little Annie mine give such full information that they might serve as a model in that respect to the managers of other mines. Such statements carry the conviction of honesty, and if, as happens to be the case here, the mine is a profitable one, even when working under many disadvantages incident to its location, the duty must be a pleasant one to the manager also. We commend these reports to a large class of our readers who are interested in mines, and who should insist on their directors publishing monthly reports of the progress of work.

LITTLE ANNIE MINING COMPANY'S BUSINESS—FROM MARCH 1ST TO AUGUST 1ST, 1878.

Receipts.	
Cash in bank, March 1st, 1878	\$905.02
Exchange, premiums credited	25.75
July 10th, L. A. retort No. 61, time 17½ days, tons 105, ounces gold 68¾, medium	1,280.00
July 21st, L. A. retort No. 62, time 11¼ days, tons 97½, ounces gold 58¾, fair	1,100.00
July 29th, L. A. retort No. 63, time 7 8-10 days, tons 47, ounces gold 109¾, fine	2,050.00
	\$5,360.77
Disbursements.	
Exchange, expressages, fining, etc.	\$88.38
F. H. Brandt, interest on bond in bank (last)	45.01
Office expenses	13.57
General expenses	230.95
Little Annie mill expenses	22.20
Placers	100.68
Little Annie mine	563.59
Merchandise	309.21
Salaries	1,747.42
Board, 1878	141.00
Little Annie mill wages	523.32
Assays	1.40
Cash in bank August 1st, 1878	1,574.04
	\$5,360.77

Payments by merchandise from March 1st to August 1st, 1878, amounted to \$1198.79.

Total net running time in 1878 of Little Annie mill, 2092 hours.

Daily yield during run No. 61 = \$73.14 = \$12.19 per ton.

Daily yield during run No. 62 = \$97.77 = \$16.42 per ton.

Daily yield during run No. 63 = \$263.32 = \$43.72 per ton.

Gold product of ten stamps in 36½ days, \$4430 = \$121.37 per day.

During the time covered by this abstract 1457 days' board has been furnished to the company's employes at a cost of 59 cents per day = 19½ cents per meal.

The undersigned arrived here from the East on May 20th, and Messrs. Brandt and Peterson on June 9th, latter by first team at the summit in 1878. On June 11th and 12th snow was shoveled from the tramway, and on the latter date the Annie mill recommenced running—thirteen days earlier than last year. On June 13th, Annie mine tunnel No. 2 was started about 150 feet north of the Annie shaft and 50 feet below it. Its purpose is mainly to facilitate and economize output, and, incidentally, exploration. Is being run very cheaply by day's work, and should be completed within two weeks. June 14th sluicing in gulch was begun—eighteen days earlier than last year. So far, as usual, this work shows a small profit.

After two years' effort, we have secured government mail service between Del Norte and the summit; commenced July 1st, giving us until November 1st a semi-weekly mail; remainder of year weekly.

A larger than usual number of pannings have preceded, and the customary number of assays followed the work of the stamps. The rock at present being crushed is equal in value to any heretofore milled, and the loss in tailings less than previous average.

Whole amount of retorts to date, gold value, \$160,221.54.

There is nothing doing in this mining district except by this company. Snow fall ceased with us on June 23d, and recommenced July 27th.

Respectfully, C. E. ROBINS, Treasurer.

FROM AUGUST 1ST TO SEPTEMBER 1, 1878.

Receipts.	
Cash in bank August 1st, 1878	\$1,574.04
Exchange, premiums credited at bank	193.70
August 7th, Little Annie mill retort No. 64, time 8¼ days, tons 49½, ounces au. 99, fine	1,800.00
August 17th, Little Annie mill retort No. 65, time 9 6-10 days, tons 57 6-10, ounces au. 73, fine	1,300.00
August 31st, Little Annie mill retort No. 66, time 14 1-5 days, tons 85 1-5, ounces au. 68¾, fine	1,300.00
Checks retired	122.25
	\$6,289.99
Disbursements.	
Exchange, expressage, fining, etc.	\$124.89
General expenses	150.00
Little Annie mill expenses	12.00
Placers	24.40
Little Annie mine wages	420.01
Merchandise	106.82
Salaries	303.33
Board, 1878	68.65
Little Annie mill wages	293.34
Cash in bank September 1st, 1878	4,786.55
	\$6,289.99

Payments by merchandise since August 1st have amounted to \$921.51.

Total net running time of Little Annie mill in 1878, 2872½ hours.

Gold product since August 1st, 1878, of ten stamps, 198½ tons, \$4400 = \$137.50 per day = \$22.76 per ton; being \$16.13 more per day than the average of last preceding abstract.

Since July 31st, 624 days' board has been furnished to the company's employes at a total cost of \$304.24 = 48½ cents per man per day, or 16½ cents per meal.

Little Annie mine tunnel No. 2, on which first ground was broken June 13th, made connection with the shaft of 1876, on August 17th. Length, 150 feet; rate of progress, 1½ feet per man per day; rock traversed, mainly quartz and porphyry; 50 feet of timbering; sectional area, 5 x 7 feet.

Its cost was the equivalent of one man's labor for 100 days, at \$2 per day	\$200.00	Supplies (powder, fuse, lights, steel, etc.) furnished	\$65.80
Add board, 50c. per day	50.00	Total cost	\$315.80

= \$3.10 per foot. This tunnel is laid with track, and the entire output of the mine passes through it on a small tram-car; contents of latter dumped from a new platform directly into the large car which goes to the mill, five loads of the

small car (1000 lbs. each) filling the large one. The new arrangement effects an important saving of both time and money in the working of the mine. Thirty-four fire assays, and a large number of pannings daily, have guided the work of the mill, and reported its tailings losses. Latter about 30 per cent.

Whole amount of retorts to date, gold value.....	\$164,621.54
Net premiums on same.....	2,167.80

Total currency production.....\$166,789.14

But little assessment work is being done in the district, and no ore is being lifted or reduced here except by the Little Annie.

An improvement of value to this company's property is being made in the building of a military road from Alamosa (the nearest railroad terminus from here) to Pagosa Springs, some 30 miles west of us, where the government has established a post and depot of supplies for Southwest Colorado and New Mexico. This road will pass up the Alamosa cañon, within three miles south of this office, and Governor Hunt (who is in charge) states that a branch will be built direct to this place. Road to be finished inside of four months.

This will give us a direct outlet (33 miles) to railroad for travel and freight, all down grade, and passable at all seasons.

Respectfully,
C. E. ROBINS, Treasurer.
To the foot-owners in the Little Annie Mining Company.
SUMMIT, COLO., September 2, 1878.

BOOKS RECEIVED.

Some of the books of the following list will receive extended review hereafter:

Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania. Part IV. for 1877. Harrisburg, Pa. 8vo, pp. 990.

Geographical Surveying, its Uses, Methods, and Results. By Frank De Yeaux Carpenter, C.E., Geographer to the Geological Commission of Brazil. No. 87 of Van Nostrand's Science Series. New York. 1878. 18mo, pp. 176. Price, 50c.

Life of John Fitch, the Inventor of the Steamboat. By Thompson Westcott. J. B. Lippincott & Co., Philadelphia, Pa. 1878. 12mo, pp. 415. Price, \$1.25.

Report on Cold-Rolled Iron and Steel, as manufactured by Jones & Laughlins' American Iron Works, Pittsburg, Pa. By Robert H. Thurston, A.M., C.E. Pittsburg. 1878. 8vo, pp. 109, illustrated.

Colorado Company (Limited) of New York and Golden. Statement of the Organization and Resources. New York. 1878. Large 8vo, pp. 48, illustrated.

Slide-Valve Gears. A New Graphical Method for Analyzing the Action of Slide-Valves, moved by Eccentrics, Link-Motions, and Cut-off Gears, etc. By Hugo Bilgram, M.E. Claxton, Remsen & Haffelfinger, Philadelphia, Pa. 1878. 12mo, pp. 125, illustrated. Price, \$1.

Hoisting Machinery. Illustrated. By the Yale Lock Manufacturing Co. Stamford, Conn. 1878. Square 8vo, pp. 52.

Annual Report of the Department of Mines, New South Wales, for the year 1877. Sydney, New South Wales, Thomas Richards, Government Printer. 1878. Quarto, pp. 212, illustrated.

La Houille et le Fer dans tous les Pays du Monde (Coal and Iron). By John Pechar, R.R. Director at Teplitz, Bohemia, Austria. French Edition. Paris: Dunod, Publisher. 1878. Being a Report of the Universal Exposition at Paris. 8vo, pp. 239.

Die Magnetische Declination und die Isogonen in Oesterreich und angrenzenden Gebiete (Magnetic Declination and Isogonics in and around Austria). By F. Pösepy. Illustrated. Alfred Hölder, Vienna. 1878. 8vo, pp. 54.

Second Geological Survey of Pennsylvania, 1875-6-7: KKK. Report of Progress in the Fayette and Westmoreland District of the Bituminous Coal-Fields of Western Pennsylvania. By J. J. Stevenson. Part II. The Ligonier Valley.

N. Two Hundred Tables of Elevation above Tide Level of the Railroad Stations, Summits, and Tunnels; Canal Locks and Dams, River Riffles, etc., in and around Pennsylvania. By Charles Allen.

Q. Report of Progress in the Beaver River District of the Bituminous Coal-Fields of Western Pennsylvania. By J. C. White. Published by the Board of Commissioners for the Second Geological Survey. J. B. Pearse, Secretary, Harrisburg. 1878.

ELECTRO-REFINING OF LEAD.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Thanks! Most careful attention is certainly due to friendly criticism, whether it be favorable or adverse. You are right in your statements and conclusions, as far as they go, but I think that you will agree with the statement which I made in the general description of the process in the issue of the JOURNAL of July 13th, 1878, as follows: "This powder is an alloy of the impurities of the base bullion, say antimony, arsenic, silver, gold, copper, and iron. It may be prepared for fusion by exposure to a red heat with access of air, which will oxidize the metals other than gold and silver, when it may be fused with soda-ash and borax; or it may be fused at once, using nitrate of soda and borax. From the slag thus obtained, antimony may be separated by well-known ways, and probably with profit." Here, then, is the text upon which I will base my argument in reply to your very pertinent inquiries.

It is well first to consider the condition of this powder. I have called it an alloy. Of this I have not made proof. It is certainly a curiosity which may repay examination. It is undoubtedly metallic, and in such a fine state of division as to be impalpable; but it does not pass through twilled muslin in filtering. Though it is immaterial to the subsequent treatment, perhaps, the question to be decided is whether it is an alloy or a simple mixture of minute particles of the several metals.

Is the base bullion a chemical or mechanical combination of metals? Are the particles of the other metals floating in the lead of the base bullion? If they are, then the powder is a mixture. If they are alloyed with the lead, then the several metals of the powder form so many particles of alloy. Perhaps the microscope may decide. Be that as it may, we have the practical separation to effect.

In laying out our plan of procedure, we must first consider the conditions and liabilities. These may be formulated thus:

- 1st. It is a wet powder, and must be dried.
- 2d. The oxidizable constituents must be oxidized.
- 3d. It must be mixed with fluxes and fused.
- 4th. Antimony and arsenic are volatile, and carry off in vaporizing, mechanically or otherwise, silver, and perhaps gold.

5th. It is absolutely necessary to get all the gold and silver, and as pure as possible, though they may be alloyed together.

6th. It is obvious that drying the powder and roasting it in a reverberatory will cause a great loss in silver from volatilization with arsenic and antimony, besides loss of powder carried off by the draught. Its roasting needs most careful treatment, as, from the easy fusibility of antimony, masses of alloy may be formed, which can not be practically oxidized. Recognizing these conditions and difficulties, my plan of proceeding is this: After having removed the powder from the filters, while it is still wet, I mix it with a proper quantity of nitrate of soda, when it may be dried without loss of dust, as the nitrate cements the whole together. When sufficiently dry, I place it in crucibles for fusion. These are cautiously heated; the nitrate decomposing gives oxygen to the antimony, arsenic, copper, iron, etc., thus forming teroxide of antimony, arsenious acid, and oxides of copper, iron, etc. The soda combines with the teroxide of antimony and the arsenious acid, forming antimoniate of soda and arsenite of soda, which are fusible. A little borax added makes the slag more liquid when the oxides of iron and copper are present. A button of pure gold and silver collects in the bottom of the crucible.

Now, though antimony, arsenic, and arsenious acid are volatile, antimoniate of soda and arsenite of soda are not; so there can be no loss from their volatilization.

Nitrate of potash may be substituted for the soda salt, with the same effect.

This slag of antimoniates and arsenites can be utilized, in the following manner:

When treated with hot water, the arsenite of soda or potash is dissolved and the antimoniate remains undissolved, together with the oxides of copper and iron. The arsenite of soda or potash is obtained by crystallization, and finds its use in dyeing, color-making, etc., or metallic arsenic may be obtained from it by sublimation.

Antimony may be obtained from the residue by mixing it with charcoal and melting in a crucible. No copper or iron need be reduced with the antimony, with proper care. But if they are, they may be removed by a subsequent fusion with some teroxide of antimony.

May be it will not be found profitable to carry the utilization further than to save the antimony and arsenic.

Now let us consider the case which you so pertinently put, or what is, perhaps, more to the point, a case of bullion treated which shows the following analyses of bullion and product of lead.

LABORATORY OF WILLIAM E. GIFFORD,
ANALYTICAL AND TECHNICAL CHEMIST, 19 BROAD STREET,
NEW YORK, July 26, 1878.

N. S. KEITH, Esq.:

SIR: I have examined a sample of the lead bullion undergoing treatment by your electric method, and also a sample of the lead resulting from the process; the samples being taken by me from your tanks July 9th, 1878.

The lead bullion consisted of:

Lead.....	96.36
Silver (161.7 oz. per ton).....	5544
Copper.....	315
Antimony.....	1.07
Arsenic.....	1.22
Traces of zinc and iron, undetermined matter and loss.....	4806
	100.0000

The lead deposited at the same time I found to contain .000068 per cent of silver (.02 oz. per ton), no copper, and only slight traces of antimony and arsenic; not sufficient for quantitative determination in the quantity used for analysis.

The examination shows the lead to be of great purity.

Respectfully yours,
WILLIAM E. GIFFORD.

We shall have from ten tons of such bullion daily the amount of 700 lbs. of powder, containing 214 lbs. antimony, 244 lbs. arsenic, and 1617 ounces of silver, 63 lbs. of copper, and a little iron. For this we will take 800 lbs. of nitrate of soda, worth 4 cents per pound, or \$12 in all, and 50 lbs. of borax, worth \$3. From this we shall get, with little labor and fuel, deducting losses, 200 lbs. antimony, and 200 lbs. arsenic, besides the silver. The antimony is worth \$24, and the arsenic is worth, as metallic arsenic, arsenious acid, or arsenite of soda, from \$10 to \$15. May be the copper residue will be valuable, and also the carbonate of soda slags produced in the reduction of the antimony and arsenic.

Whether there is a practicable plan for the electro-metallurgical treatment of this powder I have not yet considered. Such a plan involves careful and intelligent exercise of the known facts of electro-metallurgy and the possible discovery of new ones. Having the force which pervades all and moves all at our command, who can predict the extent of that which we may accomplish?

Do not, my dear Mr. Editor, think that I mean to ascribe to electricity even identity, much less omniscience and omnipotence. As well we might say that sight is life as that electricity is force. As sight is a sign and evidence of life, so is electricity a sign and evidence of force.

While again thanking you for the interest which you have shown in the new process, and the friendly spirit in which you criticize it, I will also say that I invite criticism, if it is open and honest. That which skulks and hides behind such expressions as "I've been through the mill, there's nothing in it;" "It costs too much;" "Can't cast the plates of bullion for less than the cost of zinc desilverizing," etc., etc., is not criticism. Throw open the "mill," gentlemen, and do it through the JOURNAL, that all may look in and truth come out. Let us see whether you "know all about electricity," and whether it costs \$10 per ton to cast 36-lb. plates of lead, when "buckles" for corrosion are cast mechanically for less than 50 cents per ton, and one-half pound bars of lead are cast for \$2 per ton.

N. S. KEITH.

THE TELEPHONE IN THE FIELD.—According to the *Gazette de Cologne*, the telephone is about to be utilized in the German army. The regiment attached to the railways has been making with this apparatus some experiments, which are to be repeated by the infantry regiments. These will use the telephone for the advanced guard service. The experiments in question are facilitated by some new improvements in the telephone, which is provided with an alarm and an apparatus in imitation of the bugle, worked by a magneto-electric current. Some important reviews of the troops are to take place, and will give an opportunity for forming an opinion as to the extent to which the telephone may be utilized in military operations.

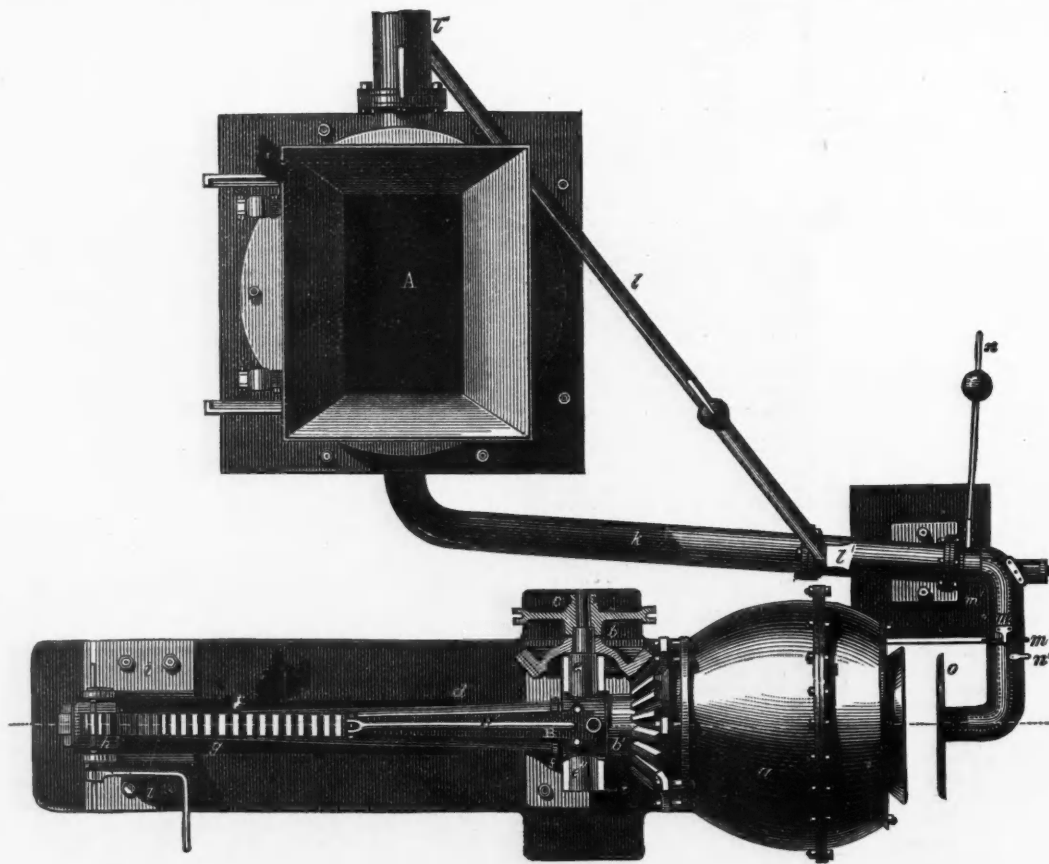
OESTLUND MECHANICAL PUDDLER IN SWEDEN.

The accompanying engravings, which we take from *Iron*, give plan and section of the puddling apparatus invented by Mr. OESTLUND, as used at the Finspong Iron-Works. The gas generator *A* is of the common Swedish type, as used for charcoal. The tube *k* conducts the gases into the refining-pot *a*. This pot has a lining of refinery slag, which is melted, as the apparatus revolves, to get it to adhere to the sides. The revolution of the pot *a* on its axis *d* is effected by the action of the beveled wheels *b* and *b'* and the pulley *c*, which takes from an iron chain the power given off by a turbine. The spindle *d* is supported in the bearings *e* and *e'*, *e* carrying a pair of trunnions which form the axis of oscillation, and allow the apparatus to rise or fall, the whole of this mechanism being supported on the plummer blocks *f f*. One of the trunnions *e''* is prolonged so as to form the axis of the beveled wheel *b* and the pulley *c*, the latter sliding along the trunnion so as to put *b* in or out of gear. The bush *e* is tied by means of the stay *g'* to the upper end of the toothed segment *g*, the lower extremity of which is connected with the second bush at the end of the spindle. By means of the pinion *h*, revolving on standards *i i*, and the segmental rack *g*, the pot can be raised or lowered without interfering with the action of the beveled wheels.

The gas from the generator is brought to the mouth of the pot by the

pot revolving at the rate of 30 or 40 revolutions a minute. The metal is worked with a rabble, either to cool it or to get the slag to incorporate with it, as is done in puddling. Note must be taken of the temperature of the melted metal and that of the pot, at the moment of charging, the heat during working being regulated accordingly by increasing or diminishing the inflow of air and gas. When circumstances are favorable, boiling begins five minutes after the metal is run into the pot, and it lasts about ten minutes.

Boiling having begun, the batch swells, the iron forms, granulates, and seems to cling to the rabble and the sides of the pot. The rotation of the pot is continued, as well as the working, to separate out parts which are not yet refined; but no more cold cinder is put in. While boiling goes on, the temperature is regulated so that the pig does not cling to the side of the pot during a complete revolution, but so that the particles next the side fall back into the bath when the side comes uppermost in the revolution. The heat is raised a little when the iron can be felt by the rabble to be completely refined, when shining lumps make their appearance in the bath, and the iron begins to cling to the walls. At the moment, therefore, that the temperature is brought to its highest point, and the iron begins to agglutinate, the rotation of the pot should be stopped, and either immediately, or after the delay of a couple of minutes, it is removed. If the iron does not ball well, it is not completely refined, and



OESTLUND APPARATUS FOR MECHANICAL PUDDLING.

tubes *k* and *m*. The air necessary for the combustion of the gas is brought in by a tube *l*, branching from the air main *l''*. The air-tube *l* passes into the gas-tube, and is continued concentrically within the latter. The gas and air tubes both have joints at *m'* and *m''*. By means of the bar *n*, which has a counterpoise to keep the moving parts in position, the tubes can be brought from or toward the mouth of the pot, so as to make it free of access to the workman. With a key fitting on the stem *n'*, the tubes can be turned in *m'* so as to give the currents of gas and air a more or less oblique direction. To screen the workmen from the heat of the pot, a disk of iron *o*, lined with fire-clay on the side next the pot, is fitted to the end of the tubes.

Before running the metal into the pot, the latter must be heated to such a degree that the slag lining is pasty or semi-fluid at its surface. Generally an hour and a half will be spent in heating with gas to this point. There should be sufficient live coal in the pot when the gas is first let in to keep up its combustion; should it be extinguished by excess of air or gas, it must be relit. As soon as the pot begins to get red-hot, the full heat can be put on.

The gas generator is tended in the usual way with the ordinary precautions. To keep ashes and dust out of the gas-tube, lumps of charcoal are heaped up to the height of the top of the flue. The wind pressure for the generator was 33 to 41 millimeters of mercury, that of the wind for the combustion of the gas (at Finspong the blast is not heated) being only 16½ millimeters. The pressure of the gas in the tube near the pot was 6.2 millimeters of mercury. The method of working, viewed chemically, does not sensibly differ from puddling; although giving as good, perhaps better, results at a much less cost. There are three principal periods in the operation: 1. The period before boiling. 2. The boiling itself. 3. The end of the boiling, and the formation of balls. When cast metal is poured into the pot, a shovelful or two of refinery slag is added. The temperature of the bath is thus brought down; it thickens and boils, the

pot may be started again. If the iron is firm enough already, the isolated particles are exposed to the hottest flame possible, the blast being carried to its maximum. The refining is thus completely finished, and all the particles are agglomerated. The mobility of the gas-tube at *m''* is of advantage in this operation. It is sometimes useful to start the pot again to round up the puddled ball, but it is best if this has been formed with the rabble.

The iron from a charge of 75 kilos. of pig may be divided with advantage into a couple of balls; a third may be made of the iron separated from the walls of the pot. To get out the balls, the pot is lowered, and the workmen use tongs, pointed rabble, and hooked bar. If things have gone well, the balls ought to come out soft at a welding heat, filled with cinder like puddled balls, but a little more resisting and solid under the hammer. They are forged into bars, and these are at once passed to the rolls. If nothing hinders the balling and shingling, these operations will not consume more than fifteen minutes.

WOOD PAVEMENTS IN LONDON.—The asphaltum pavements, which were being extensively laid in London six years ago, have been mostly taken up in the business sections, and wood pavements substituted. The greater portion of the Strand is now laid in wood, and it is being laid at various points of Cheapside, Fleet street, up toward the Bank of England. Some of the suburban streets are also paved with wood. A bed of asphaltum is at first laid, and allowed to harden, and on this the blocks are laid. They are of hard seasoned wood, and are first kyanized. After being laid, coal-tar is poured in all the crevices, and when opened for travel it presents a very solid and enduring appearance. It has been in use for a couple of years in the neighborhood of Charing Cross, and it is solid and perfect as when first laid. The asphaltum caused great injury to horses, as it became very slippery in wet weather, and for this reason was removed and abandoned.—*Eng. News.*

RUSSIA SHEET IRON.

NEW YORK, September 19, 1878.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I beg to inclose herewith copies of papers, etc., relating to genuine and imitation Russia iron. They are extracts from the *Iron Age's* editorial of September 12th, and my answers thereto. I sent the original to the editor of that journal for publication; but since he has declined to give it publicity, I would be greatly obliged to you if you would allow me the use of your columns to vindicate myself, and to set forth the facts as they exist.

I remain, respectfully yours, EDWARD P. WHITE.

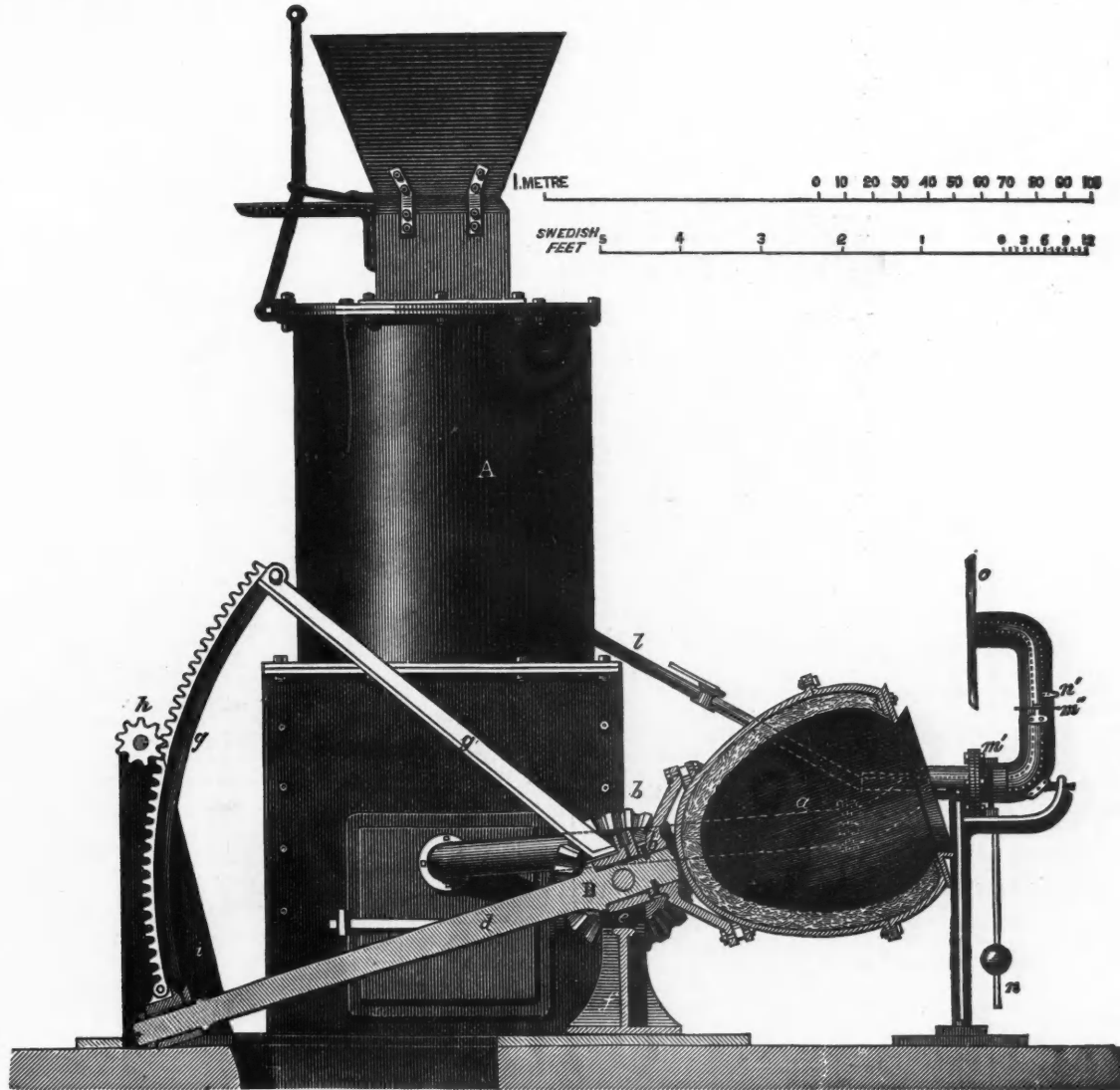
The following are extracts from the editorial above referred to:

"When it is remembered that the planished iron industry was begun under great difficulties, and that the product had to overcome a strong prejudice in favor of Russia iron which had been strengthened by previous unsuccessful attempts to manufacture such iron in this country, the success of the planished

culated to prejudice the trade against an article which experience has shown to merit their entire confidence.

"So far as the statements above quoted apply to American planished sheet-iron, they are absolutely false. It has not been 'found wanting' after several years' trial, nor has it been found unfitted for general use. On the contrary, instead of the reported increase in the consumption of Russia iron being due to a falling-off in the consumption of American planished iron, we find upon inquiry that the production and sale of the American iron during the first half of 1878 exceeded that for any previous six months by 3000 packages. The facts regarding this iron may be briefly stated as follows: Its manufacture was begun in 1873, at a time when Russia iron controlled the market without competition. For some years the importation of Russia iron ranged from 20,000 to 25,000 packages per annum. This year the sales of American planished iron will amount to between 15,000 and 20,000 packages, while during the past three years the importation of Russia has not averaged 1000 packages per year. When it is remembered that this amount is exactly one twenty-seventh of the largest amount of Russia iron imported in any one year, it requires a stretch of the imagination to believe that the statements above quoted have any foundation in fact.

"In saying that the quality of the American planished iron is in all respects



OESTLAND APPARATUS FOR MECHANICAL PUDDLING.

iron industry becomes all the more conspicuous and reflects the greater credit upon those who have overcome so many and serious obstacles. When the manufacture of this grade of iron was begun here, there were very few who believed that it would become an established industry or that the product would meet the wants of consumers of Russia iron. Now there are but few who do not find the American article preferable to the imported. * *

"We have been led to these remarks by having had our attention called to an effort on the part of certain persons interested in the sale of Russia iron to further their own interests by disparaging the American planished iron, now almost exclusively used in place of Russia. As the means they have taken to do this are unfair and involve a misstatement of facts, we think it only just to a very promising domestic industry to say a few words in its favor. Two circulars issued by prominent metal brokers have been brought to our attention which serve as illustrations of what we mean by unfair efforts to disparage the American planished iron. One of these circulars, speaking of imported Russia iron, says: 'The rise which has lately taken place is not speculative, but simply on account of small stocks and the unprecedented demand for genuine Russia. It would seem as though, after a trial of several years, the imitation has been found wanting.' The other circular contains the following: 'Russia iron has advanced fully 1/2c. per lb., owing to reduced stocks, and no important arrivals expected before the middle or last of September; and more particularly by the unexpectedly large demand, inasmuch as the patent planished iron, after three years' trial, is found not fitted for general use.' From the coincidence of date and statement, it would be fair to conclude that these circulars were inspired from a common source, and that they are part of an effort now making to bolster up a declining importing trade. This effort is perfectly legitimate and proper, in itself considered, but it ceases to be either the one or the other when recourse is had to misstatements cal-

equal to the imported Russia iron, we merely record the experience of consumers."

[CIRCULAR.]

RUSSIA SHEET-IRON.

GENTLEMEN: The manufacturers of planished or "imitation" Russia sheet-iron have distributed an extensively-signed circular, dated September 1st, 1878 (which the *Iron Age*, of this city, in its issue of September 12th, has published, together with an editorial upon the subject), directing attention to remarks said to have appeared in a circular, or circulars, issued by a New York broker, or brokers.

Inasmuch as they have been erroneously (except as hereinafter mentioned) attributed to me by many, I take this opportunity to say that the only remarks ever made by me in a circular in reference to imitation iron, were on August 23d, 1878, and as follows, after referring to the unexpected demand for genuine Russia:

"It would seem as though after a trial of several years the imitation has been found wanting."

My personal opinions, or those expressed by letter to my friends, are not called in question; therefore, at this time, it is not necessary to refer to them. I would simply say that I fully appreciate every real advance made by our manufacturers, but can not shut my eyes to faults; and as the merits of the "imitation," as compared with the "genuine," have been tarted, I do not hesitate to say that the manufacturers of "imitation" are still before them the task (which I trust they will soon be able to

overcome) of making an article that will stand the effect of different climates, and not corrode easily.

A few years since, I was informed by certain large Western jobbers that they would never want the "genuine" again, but there has been a heavy call from them and others this season for it; hence I attributed the extra demand to a discovery of fault above mentioned.

This demand has cleared the market unusually early of all light numbers. Another year we shall probably see a better supply, and, I trust, lower prices for both kinds, genuine and imitation, and this state of things will probably gratify the party whose opinions have been so boldly expressed through the medium of the editorial referred to above.

I remain, gentlemen, yours respectfully.

NEW YORK, September 14, 1878.

EDWARD P. WHITE, Broker.

TO THE EDITORS OF THE IRON AGE:

DEAR SIR: Noticing your exhaustive article on "Planished Iron," in your issue of the 12th inst., in which, after quoting a paragraph that appeared in a late circular issued by me, you proceed to publish said remark as "absolutely false and unfair, and a misstatement of facts," I beg to hand you a copy of an unsolicited communication received this day from an occasional correspondent, which speaks for itself. If this is not sufficient to justify the obnoxious paragraph in my circular, more and abundant proof shall be forthcoming.

Your conclusion that my statement is "part of an effort now making to bolster up a declining importing trade," I would simply contradict. I neither have lent nor would lend my efforts to any such combination, and more particularly if, to make it successful, as you say, "recourse is had to misstatements calculated to prejudice the trade against an article which experience has shown to merit their entire confidence."

In closing, let me add that my remark was a totally unpremeditated one, occurring in a paragraph giving my views on Russia iron, in a circular addressed to my customers, and I deny all imputations of having made an uncalculated-for attack on imitation or planished iron. Trusting that the same courtesy shown to others in the publication of statements will be extended to me, in the interest of truth, I remain,

Yours respectfully,

EDWARD P. WHITE, Broker.

NEW YORK, September 17, 1878.

[Extract from a letter dated September 16th, referred to above.]

"We have thought that you might be pleased to learn the opinion of those who use Russia iron, or its equivalent, and therefore have practical knowledge of its merits or demerits. Allow me to say at first, that we suppose that by far the largest part of genuine or imported Russia iron goes into the hands of the retail stove dealers, and is used in mounting stoves and for stove-pipe. It is for this purpose we use such iron, and our experience only relates to it in this manner. When the planished iron first came out, it was sold at quite a reduction from the price charged for the genuine. The appearance of the iron was good; the lengths were such that it cut to better advantage, and every dealer no doubt felt that he preferred to use goods of American manufacture, provided it was suitable to his wants, and the price such as he could afford to pay. These inducements led us to take hold of it, and we used it for two years, and then gave it up and returned to the genuine, and have continued to use the same up to the present time.

"Our principal reason for giving up the imitation or American planished was, that where stove-pipes or a stove mounted with this iron was set away during the summer, a fine, red rust would cover it, and in a few seasons the iron lost its luster, and looked very bad. The other reason, and not of as much importance, was that the iron does not work as easily. It is more springy, and does not form so easily into pipe or other work. Our opinion is, that the genuine is far more durable than the imitation and cheaper to use, at a difference of two or three cents per pound. We hope and believe this will not always be the case, and that our own iron will be as good as the genuine."

NEVADA AND CALIFORNIA MINES.

Special Correspondence of the Engineering and Mining Journal.

In Sierra Nevada all calculation is out of the question. One day a rumor that FLOOD is caught short will send the stock to 220, and the next day a rumor that large quantities of boiling hot water had been struck, throws the stock again to 150. The public is simply mad, and is ready to believe any thing. Reports from the mine are that the incline is cutting better and more ore, and some think the ore-body widening; others, the ore-body only pitches flatter, which would make the incline run through it. People are wild with assay reports, but nothing definite is known as to further assays. With the extent of the ore-body not opened up to inspection, the value of the mine at from 15 to 22 million dollars is certainly somewhat doubtful.

California, having passed her dividend, has fallen behind Cons. Virginia, as of old. Some hope an early resumption of dividends in the latter mine will take place. If so, I think it will be a dollar dividend and no more, and for that I look not for 60 days as yet.

Union runs in sympathy with Sierra Nevada; but what sends Mexican up to 59? Certainly not the Sierra Nevada ore-body, and yet it seems so. Julia has quieted down from the momentary excitement in cross-cut No. 1; yet the frequent presence of ARCHIE BORLAND at the mine should lead one to expect some kind of a gamble soon.

Bodie, in spite of the newly-declared dividend of \$3, due this 14th, went to \$28½. Rumor says that insiders who realized at the high prices are trying to get in again, and that a general bear raid is in store for Bodie. At any rate, the Virginia and Truckee Railroad, with D. O. MILLS, must have some confidence in the camp, for a new railroad from the Mound-house, via Dayton to Aurora and Bodie, is proposed. Rumor says it will be surveyed immediately, and YERRINGTON, BLISS & Co. have secured the contract for 250,000 ties. Another cause lies probably in the giving up of ground of the Bodie Company to the Mono Gold Company, and the arrangement, in turn, that each holder of one share of Bodie stock shall receive one share of Mono stock as compensation. It was always conceded that the title would not be O. K. until some satisfactory arrangement could be made, as this appears to be. Mono, of only a few days' life, has now a 50c. assessment on it.

Tuscarora shows very little life, and appears generally inactive. C.

QUICK-SPEED HAND-DRILL.

Our engravings represent a new and useful tool for light drilling in wood or metal, invented by Mr. C. L. BELLAMY, of Arlington, N. J. Its chief parts are a fly-wheel carrying the drill, and a pulley-spring and clutch mechanism, all of which revolve loosely on a spindle held stationary by a handle (Fig. 1). The action is as follows: By drawing with one hand a string wound around the drum, the latter and the clutch, together with the fly-wheel and drill, are set in motion at a certain speed. At the same time, the spring attached to the drum is tightened. As soon as the tension of the hand holding the string is relaxed, the move-



FIG. 1.

ment of the pulley is reversed, taking up the slack at the same time. The fly-wheel and the drill do not, however, take part in the reversal of the motion, owing to the action of the clutch. A continuous revolving movement in one direction is thus insured for the drill, the speed varying from 500 to 1000 revolutions per minute. The necessary feed may at all times be felt, and be accordingly controlled by the hand grasping the handle. The drill may be used in any position, and drills of any kind can be inserted.

By the use of a simple attachment, which is not shown in the cut, the

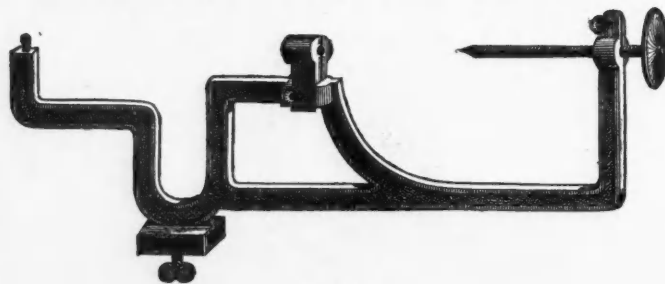


FIG. 2.

instrument can be so arranged that it may be operated with one hand. Another attachment, shown in Fig. 2, is provided, by which the drill can be worked by hand or foot; this consists of a bracket for holding the drill, converting it into a tool similar to a small lathe. The bracket is held by inserting the bottom in the jaws of an ordinary vise. In this case, the drill can be used for polishing. The tool is a very neat and effective one, and seems capable of doing a pretty wide range of work.

For further particulars, address JAMES D. FOOT, 22 Platt street, New York.

GAS-ENGINES.

The new, silent Otto engine has proved to be a decided step toward the solution of the problem of thermo-dynamic engines, and having been found to realize the anticipations formed of the soundness of its theoretical principles, and having given the best results in its practical working, it has been forthwith adopted by all the manufacturers of the Langen-Otto engine, and has superseded the latter in the demand on the part of users.

Before, however, passing to a description of this remarkable invention, a few words on behalf of the Langen-Otto atmospheric engine deserve to be said, since it represents a fairly-successful and most ingenious solution of a most difficult problem, which its inventors, in the face of many difficulties and financial reverses, and after much intellectual labor, succeeded in accomplishing, and for which they succeeded in securing an

extensive introduction. A most interesting point has been stated in connection with this engine, and should not now be overlooked, namely, that, looking upon it from a purely scientific stand-point, the duty realized on the brake per heat-unit is greater than that developed by the best large steam-engine, taking 2 lbs. of coal per H. P. per hour; the latter realizing but 8½ per cent of the theoretical efficiency of the fuel, while the gas-engine realizes 12 per cent, or nearly one and a half times that amount. The mechanical details of construction presented by this engine offered some exceptional features, which, being not in accordance with customary forms of construction, appeared to be rather bold, and were even called "unmechanical." This qualification, however, can not be said to have been deserved, since the engine thoroughly proved its practicability as a machine, and may serve as a proof of the very interesting fact that a rotary motion may be obtained with satisfactory results from a toothed rack, instead of by a crank and connecting-rod; a statement the correctness of which is guaranteed by the history of this type of engine during the last ten years.

The manner in which the governor stops all motion of the parts, except that of the fly-wheel and shaft, as soon as the work is thrown off, or less than full work is required, is characteristic of the Langen-Otto engine, and realizes economy both in fuel and in wear and tear. But the low pressures used in this engine require large diameters of cylinder, in consequence of which the engine becomes bulky for powers greater than two H. P.

Though the attempts at realizing a gas-engine working by direct force of explosion had, up to that time, proved impracticable, the fact remained that if the sudden pressure of the explosion could be fully realized and converted into steady work, higher pressures might be preferable, and to realize this conclusion in practice the inventors of the Langen-Otto engine continued persistently to experiment until they had at length succeeded in producing the engine known at present as the "New Otto Silent Gas-Engine," in which a sustained pressure is utilized on the piston by a quick combustion—a feature which was the lacking element in the previous forms of explosive engines. The following explanation will suffice to make clear the essential features of this new contrivance.

Instead of the usual explosive mixture of gas and air, used up to the present time in explosive engines, a diluted mixture containing more air than the complete combustion of the gas should require, is introduced in the cylinder by the first out-stroke of the piston; in the following in-stroke this charge is compressed to a certain degree, and at the end of this stroke is ignited by slide-lights. By this manner of compressing a diluted mixture, which at ordinary atmospheric pressure would enter into combustion too slowly to produce any useful effect, the particles of the gases having been brought more within the range of chemical attraction, will produce a combustion quick enough to develop the maximum pressure at the beginning of the stroke. Such a compressed weak or diluted mixture will burn more slowly than one containing a higher percentage of gas, while the heat resulting from the combustion is imparted to the non-combustible portion of the mixture, expanding it and giving that sustained pressure before alluded to as a desirable feature, that can be transformed without jars or shocks into useful work. The mechanism may be more fully comprehended by reference to the accompanying cuts.

The gearing of the engine is effected by a gearing-shaft running longitudinally with respect to the cylinder. Motion is imparted thereto by conical wheels from the crank-shaft in such manner that the latter makes two revolutions while the former makes one. The gearing-shaft actuates the slide by one crank and one connecting-rod, and by means of this slide, the functions of giving inlet to gas and air, and of igniting the charges each at the proper instant, are performed. This slide works with its inner side against the cylinder-head, and with its outer side against the face of the slide cover or cap, which is pressed by springs against it, and furnishes an equilibrium against the pressure.

A very effective and useful arrangement, one that appears to act as an automatic regulator of the amount of fuel consumption in relation to the amount of work thrown on the engine, more perfectly than in any other form of engines than gas-engines, is the combination of the governor and a lever moving a sliding sleeve fitted on the gearing-shaft. This sleeve is provided with a cam, which actuates the gas-inlet by a small roller and lever, when the governor puts the sleeve in position so as to cause the cam to meet the roller. If surplus of speed makes the governor rise, the sleeve and cam thereby being slid aside at roller, the gas-inlet valve is left unopened, air alone is drawn into the engine, and no effective stroke takes place, until the speed, falling to its minimum, inside of the limits of the allowed variation, the governor, by dropping, and thus putting the cam in position to open the gas-inlet, gives entry to a new

charge into the cylinder and an impulse to the piston. By this, it will easily be seen that, though the number of revolutions per minute of the engine will be the same, whether working full power or with no load, the number of effective strokes, or the number of the combustible charges taken in per minute, will vary; so that when the engine runs idle, it will have one revolution only for four revolutions of the gearing-shaft, while a charge of gas and air is introduced; but while doing the full work, gas will be admitted by the governor on each revolution of this shaft. Besides the advantage derived therefrom, with respect to economy, that of not having the speed slackened down when work is thrown on, or having engine running away when some is taken off, will often be of importance, especially as the defective working of governors with steam-engine, and the keeping of a steady pressure in small boilers, have often been found a difficulty when the work required a varied and constantly-changing amount of power, as in the case of hoisting, etc.

The exhaust of the engine is operated by a lever and a cam moving the escape-valve. The governor is inclosed in a case, and thereby the scattering of the oil used for lubrication by centrifugal force is prevented. Two automatic oil-cups on top of cylinder, moved by a small shaft and pulley, as soon as engine is running, deliver a certain number of drops of oil to the slide-valve and the cylinder and piston, and thereby the only attendance left for lubricating has been almost entirely confided to the engine itself. An automatic arrangement is furthermore provided to stop the inlet of the gas, in case the engine should stop accidentally, and thereby waste the gas that might escape by the engine stopping in the position where the gas-valve would possibly be opened. Gas consumption averages 21½ cubic feet per ind. H.P. per hour, and diameters of cylinder have been reduced to about one quarter of that of the atmospheric engine for same power. The new Otto Silent Engine, therefore, is also available for higher powers than the former gas-engines were; and up to the present, 12 ind. H.P. engines have been built and delivered for practical work in large numbers.

The Silent Gas-Engine has quickly found its way to this country, and has been already applied to practical work in various places. Notwithstanding the high prices of gas in this or other cities, these engines, considering the small quantity they require, work economically, and though 21½ cubic feet of gas might cost more sometimes than the fuel of 15 to 20 lbs. of coal in small steam-engines, the attendance and trouble for coal and ashes, water, etc., which do not exist with gas, will

leave the balance of the sums of all expenses very much in favor of the gas-engine. Meanwhile, where work is intermittent, economy and convenience are at their maximum in a gas-engine, and at their minimum with steam. The Silent Gas-Engine, as built in this country by

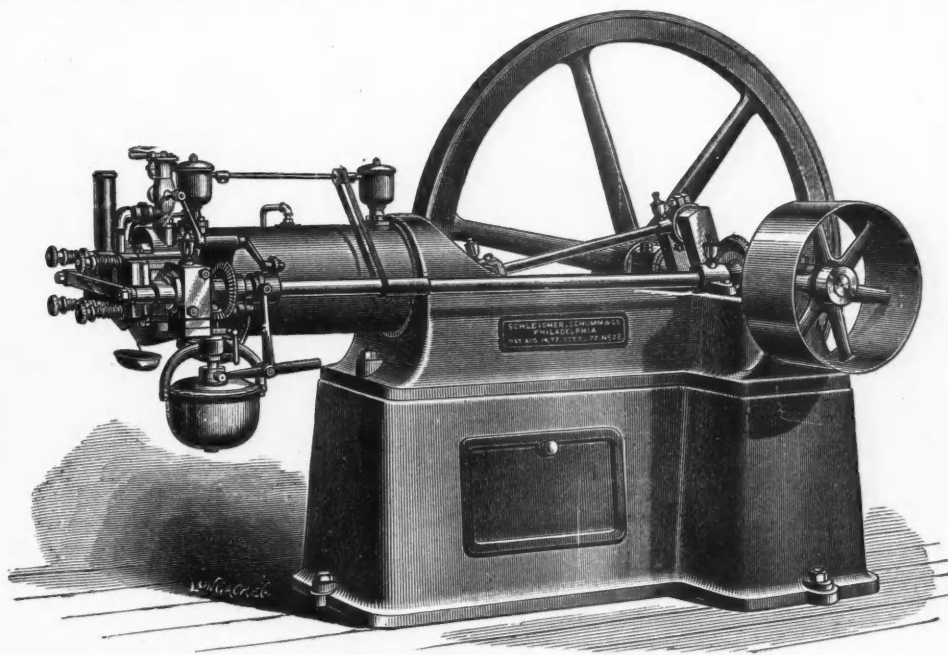


FIG. 1.

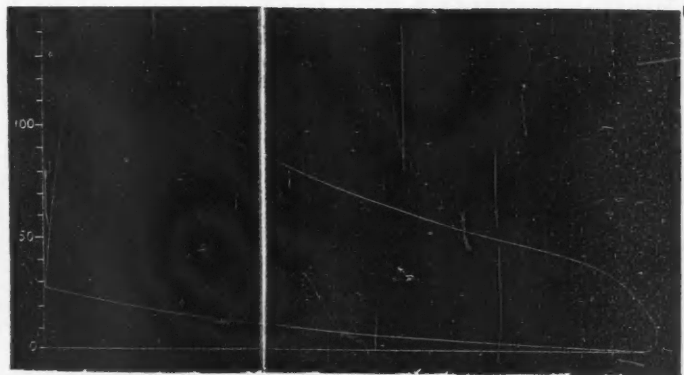


FIG. 2.

WILLIAM B. BEMENT & SON, of Philadelphia, shows exceptional accuracy and quality of work. The construction of the engine, as shown in the illustration, is designed by Messrs. SCHLEICHER, SCHUMM & Co., engineers and machinists, 3045 Chestnut street, Philadelphia, which firm controls the sale of the Otto Gas-Engine in this country.—Polytechnic Review.

BRITISH INDUSTRIAL TROUBLES.—LONDON, September 19.—An important strike by the coal miners in North Staffordshire is apprehended.

BRITISH COLUMBIA COAL-FIELDS.

A special correspondence to the *Colliery Guardian* from the Paris Exhibition gives the following information concerning the British Columbia coal-fields and mines:

The principal coal-fields—indeed, the only ones of any importance hitherto—in the Dominion, are those of the provinces of Nova Scotia and of British Columbia, and we find that, notwithstanding the continued depression of the coal market in San Francisco, the total yield of coal for the year 1877 exceeded the out-put of the previous year by nearly 15,000 tons in the latter province. There were four colliery companies at work during part of the year, but the depression above referred to has caused the non-continuance of work at one, the Harewood mine; and at another, the Baynes Sound Company's mine, they have temporarily ceased to take out coal, though the company is not idle, but, acting on the advice of a geologist, is engaged in boring between its present mine and the sea, with a view of testing still further the value of its property.

Vancouver Coal Company, actual output.....	94,809 tons.
Wellington colliery, " "	48,743 "
Harewood mine, " "	9,000 "
Baynes Sound Coal Company, " "	1,500 "
Total.....	154,052 "
Total output of coal, 1876.....	139,191 "
Increase for 1877.....	14,861 "

The following particulars will be read with interest:

The Vancouver Coal Company employs 428 hands, viz.: 301 men and 17 boys (whites), 87 Chinese, 23 Indians. Wages: Whites, \$2 to \$4; Chinese, \$1 to \$1.25; Indians, \$1 to \$1.50. Miners' earnings, \$2.75 to \$5. Value of plant, \$123,000, in Douglas, Chase River, and Fitzwilliam pits.

The Douglas mine, Nanaimo, worked by slope, has six levels, three of which are in operation. The coal in the lowest is about 5½ to 6 ft. thick, first-class gas-making coal; the old shaft now used as an up-cast. New Douglas, 1½ miles distant, situated near to Chase River, is being opened by slope, with three north and south levels. The thickness of the seam, which is very clean, and is held in very high estimation in both foreign and domestic markets, for both steam and household purposes, varies from 4½ to 9 ft. The capacity is now 280 tons, but this will be doubled on completion of the powerful hoisting and pumping engine now in course of erection. The Fitzwilliam mine, on Newcastle Island, is worked by slope of 800 yards, and produces first-rate steam coal. The Newcastle mine, not in operation, 240 yards, by slope, on the island. Chase River mine, 290 ft. deep, worked by shaft, but not at present in operation. At their wharves the company has facilities for delivering 1500 tons per day.

The Wellington collieries employ 252 hands—of which 162 men are whites, 80 Chinese, 10 Indians—at wages ranging same as above. Plant value, \$140,000. Wellington mine No. 1, slope, 8 to 10 ft. thick, 183 ft. shaft; two 3-ft. seams not working.

The Harewood colliery employs 83 hands—40 white men and three boys, and 40 Chinese—at similar wages. Harewood pit has one workable seam, 3 ft. to 9 ft. thick; 1 tunnel (water level); air level, 6 ft. by 6 ft.; drawing level, 6 ft. by 18 ft. Value of plant not ascertained.

Baynes Sound Colliery has one 7-ft. seam, one 4 ft. 6 in. seam; six tunnels; at present only working one drift, which is driven level-free into the No. 4 (4 ft. 6 in.) seam for about 400 ft. on north side of the river.

NEW PATENTS.

The following is a list of the new inventions relating to Iron, Coal, Mining Machinery, Chemical Apparatus, and the treating of Precious Metals, etc., from *The Official Gazette of the United States Patent Office*, for the week ending July 23d:

No. of Patent.	Title of Invention.	Name of Inventor.	Residence.
206,166	Galvanic Batteries.....	Elisha B. Cutten.....	Boston, Mass.
206,173	Valves for Regenerative Hot-Blast Stoves.....	John M. Hartman.....	Philadelphia, Pa.
206,175	Fire-Proof Roofing.....	Edwin W. Hickman.....	Lake, Wis.
206,176	Road-Engines.....	B. C. Hicks.....	Rose Township, Ramsey Co., Minn.
206,235	Compound Engines.....	Moses B. Harvey (a).....	Leavenworth, Kan.
206,236	Coverings for Steam-Boilers.....	Edwin A. Hayes.....	New York, N. Y.
206,241	Speaking Telephone.....	John H. Irwin.....	Philadelphia, Pa.
206,242	Rock-Washers for Oil Wells.....	Frank Jeannerat.....	Edenburgh, Pa.
206,257	Amalgamators.....	Edward L. Newell.....	Butte City, Mon.
206,266	Extracting Fuel from Waste.....	Nicolaus Schröder.....	Creuznach, Prussia
206,268	Rotary Exhaust Cylinders and Balanced Slide-Valves for Steam-Engines.....	Joseph M. Searle.....	Stanhope, N. J.
206,309	Processes and Apparatus for Recovering Waste Sulphuric Acid.....	F. F. Farrar and F. P. Gill (b).....	Waterford, Pa.
206,330	Rolling-Mills.....	Alexander Hooven.....	Norristown, Pa.
206,353	Hydraulic Elevators.....	William O'Keefe.....	St. Louis, Mo.
206,356	Air-Engines.....	Alexander K. Rider.....	Walden, N. Y.
206,361	Steam-Traps.....	Levi F. Smith.....	Philadelphia, Pa.
206,380	Rotary Engines.....	William C. Wolfe.....	Johnstown, Pa.

(a) Assignor to Samuel H. Ellis, South Leavenworth, Kan.
(b) Said Gill assignor to said Farrar.

THE ANNUAL PRODUCTION OF THE SUGAR OF THE WORLD has been approximately calculated as follows: Bengal, China, and Siam, 300,000,000 lbs.; British Colonies, 440,000,000 lbs.; Spanish Colonies, 470,000,000 lbs.; Dutch Colonies, 160,000,000 lbs.; Swedish and Danish Colonies, 20,000,000 lbs.; French Colonies, 160,000,000 lbs.; France (beet), 360,000,000 lbs.; Brazil, 150,000,000 lbs.; Zollverein (beet), 550,000,000 lbs.; Austria (beet), 178,000,000 lbs.; Russia (beet), 100,000,000 lbs.; Italy and Belgium (beet), 200,000,000 lbs.; all other sources, including the United States, 400,000,000 lbs.; total, 3,420,000,000 lbs. The annual consumption of sugar per head by different nations varies very considerably, as may be seen by the following figures, based on official data: In the United States, 33 lbs. per head; England, 30; Scotland, 30; Holland, 16; Ireland, 5; Belgium, 6; France, 6-66; Spain, 6-24; Switzerland, 6; Portugal, 5; Denmark, 5; Poland, 5; Prussia (Zollverein), 10; Norway and Sweden, 9; Italy, 2; Austria, 2; Russia, 1. Surely there must be something wrong in the statistics that make the average Englishman eat more than four times more sugar than a Frenchman!

COLORADO COAL MINES.

Special Correspondence of the Engineering and Mining Journal.

By the 10th of this month the extension of the A., T., and S. F. R.R. south from La Junta will be completed to Trinidad. The event is anxiously awaited, and tons of freight are accumulating to be sent on the new road. Contracts for furnishing the road with coal have been made with Trinidad parties; also contracts for the erection of coke ovens have been entered into, and from the appearance of things Trinidad will soon be a large coal-producing place.

One and a half miles south of Trinidad is the Rifenburg bank. It has been drifted 250 ft. It is of best quality of post-carboniferous coal, and the best for coking in the West. The coal lies under a sandstone rock, and the vein is 11 ft. 3 in. thick. The Denver and Rio Grande Railroad Company is working the same vein on the other side of the mountain. They now have fifteen working coke ovens at El Moro, and forty more in course of construction. This mine has also been worked for about 200 ft., and they are now taking out 100 tons per day. They ship the lump and utilize the slack for coke. STARK, WICKS & Co. are working the same vein up the Raton Pass about four miles, and they are waiting to ship on the new road.

Mr. JOHN PETERS is prospecting for coal, with the intention of going into mining it extensively. EM.

HYDRAULIC SALT-MINING IN BAVARIA.

A correspondent of the *World* describes at great length the process of salt-mining in use at Berchtesgaden, Bavaria. At this place the salt does not occur in deep rocky strata, as at the Polish mine at Wieliczka, but in a thick layer of saliferous earth in the heart of a mountain. The mine is entered by horizontal shafts, and the salt ingeniously removed by the solvent action of water working upward. At the end of each shaft a chamber is mined, and when it is large enough the entrance is dammed up and the chamber filled with fresh water through an opening at the top. The water is to dissolve out the salt from the roof of the chamber; hence it is necessary that the chamber be kept entirely full. At first, the water acts also upon the bottom and sides of the chamber, but soon there is left a pasty waterproof covering of clay, which prevents further action. At the top, however, the overlying earth falls away as a fine sediment as fast as the salt is dissolved, leaving always a fresh surface for the water to act upon. The falling sediment forms, under pressure, a watertight floor to the chamber, which rises as the solution of the roof goes on, so that the chamber slowly climbs from the bottom to the top of the salt-yielding stratum. The solution has to go on with the utmost quiet, and not too rapidly, or else fragments of the roof will fall to the bottom, where the water is saturated with salt, and be lost. To keep the water constantly pressing against the roof, a proper supply of fresh water is continually added from above. Complete saturation of the water is effected in about three weeks, when it is pumped out and carried in pipes to Reichenhall, twenty miles distant, for evaporation. Fresh water is then pumped into the chamber, and the process repeated until the upper limit of the salt deposit is reached. In this way the mountain is being slowly washed, and its saline treasure stolen away, without removing the clay with which it was associated. The saliferous earth removed in tunneling is refined in the usual way.

GEORGIA GOLD FIELDS.

Special Correspondence of the Engineering and Mining Journal.

In Gainesville, Hall County, Ga., I met a gentleman who showed me samples of a coarse-grained itacolumite. He told me that it had been subjected to a severe test as a refractory material in a blast-furnace, with complete and satisfactory results.

I understand that itacolumite has lately been used in some furnaces in other parts of this region. The deposit from which the samples that I saw came is situated on the railroad near Gainesville. I am informed that it can be mined and delivered on the railroad at the cost of \$2.50 a ton. If it is as good as claimed, it will prove a formidable competitor to fire-brick for uses to which it is suited.

The mineral lands along the belt in which gold is found are divided into forty-acre lots, more or less. The original surveys, upon which the present ownership of property is decided, were very incorrect, and the area of what are known as forty-acre lots varies from 50 to 30 acres. All maps of the country, however, are drawn as if correctly divided. In comparing two maps with each other, I detected an error of over a quarter of a mile in the position of one of the principal rivers in about half a mile of distance between two points on the river.

The *White Pigeon Mine* has been developed to some extent. It has a ten-stamp mill run by steam-power. The tailings, after escaping from the plates, fall into a shallow pit, in which there are two revolving cross-shaped stirrers; the mercury gets a chance to settle down, and the tailings pass off.

Col. R. H. Moore has a four-stamp wooden mill, run by an over-shot water-wheel 18 feet in diameter.

Messrs. Huff & Roberts have a nine-stamp mill, five stamps iron and four stamps wood, run by an undershot water-wheel.

Cols. Barlow and Hand are fitting up the building occupied by the old Pride mill with a new twenty-stamp mill. Work has not yet actually been commenced inside the building, but outside an extensive engineering undertaking is nearly accomplished. Cane Creek is to be turned into a new channel and utilized in working the mill.

The *Ogle Mill* is a five-stamp iron mill; it is run by an over-shot wheel. The ore is sluiced down from an open cut as in the larger workings. The results of a few days' run last week were eminently satisfactory. More than \$70 per day for a three-days' run was obtained.

Bohrer & Co.—In the same neighborhood as the above-mentioned mills there is an extensive gravel deposit in a bend of the river. The gravel is from 6 to 7 feet deep, and is covered with from 10 to 20 feet of earth. It is being worked on a lease by Messrs. Bohrer & Co. They use the hydraulic process, as practiced in the West. The head of water is about 60 feet, but the water is taken from the Hand ditch, which is 200 feet higher

This head is not at all utilized, the water being allowed to run down the mountain side till it arrives near where it is to be used.

At *Bagg's Branch*, about six miles S. S. W. from Dahlonaga, is a very successful mine. The property comprises 100 acres, and the veins which run through it are quite rich, some exceedingly so. The one thing lacking to secure a thorough development and quick returns is plenty of water at a high level, without the expense of raising by pumping it. This subject is under consideration at present, and, I believe, that before long the difficulty will be overcome. The present supply of water is pumped from the foot of the hill up to a reservoir on the top through 500 feet of pipe, which is equivalent to 170 feet of perpendicular height. The mining is conducted by breaking up the rock with picks and then washing the ore and slate down through a narrow ravine about 2 feet wide, which leads to the sluice-boxes connecting with the mill. At a convenient place in this ravine a movable wooden grating is placed which catches the ore as it is washed down and allows a large part of the slate to wash through as mud. After the ore has all accumulated behind this grating, it is removed, and the water from a ditch slightly above the level of the grating is turned on, and the ore by it is carried down into the mill.

The reservoir measures 100 feet in length, 8 in breadth, and 4 in depth. There are five open cuts that have been worked, one of which only is being operated on at present, owing to the scarcity of water.

The slate is very much curved toward the top of the hill, being perpendicular at the top, and dipping toward the southeast as it descends.

The mill has ten stamps, each of which is about 480 lbs. in weight, and with a fall of 9 inches. The present cost per week of treating the ore, including all expenses, is about \$60, the average yield being about \$100. The yield is increasing, the present yield per ton being about three times as much as when first opened. The value of the gold as extracted is about \$1 a pennyweight.

THE LARGE WATER-PIPE OF THE HAND DITCH COMPANY.

In my letter which appeared in your issue of September 7th, I notice an important though inadvertent error on my part. I there mention that on the main Hand ditch there is only one length of iron pipe of 230 feet. I should have said it was 2300 feet long. It crosses the Yahoola River, and between its highest and lowest points there is a difference of level of 246 feet. Its internal diameter is 36 inches clear; it is made of boiler iron varying from $\frac{3}{8}$ to $\frac{5}{8}$ of an inch in thickness, and is put together in sections of 21 feet by cast-iron flanges. The joints are calked with lead. These sections were made in Boston and shipped to Atlanta; from there they had to be drawn by oxen and mules to this place. The joints were all tried in the lathe before leaving Boston, and there are now no leaks visible at any of the joints.

At the bottom of the valley there is a horizontal portion 200 feet long. This rests on stone piers built from the bed-rock. The center section of pipe is 42 feet long and spans the river.

This pipe is the most important one on the line of the ditch, and cost a very large sum to build. It, as well as the other pipes, have been substituted for the old trestles since Col. HAND has taken charge of the ditch.

J. B. MACKINTOSH.

NOTES.

UTILIZING SOLAR HEAT IN ALGERIA.—M. Mouchot, the inventor of a successful form of sun-engine, has presented to the Paris Academy an account of his experiments with it in various parts of Algeria. In that country he has demonstrated that solar heat can be utilized for cooking food, baking bread, and distilling alcohol, besides furnishing the motive power for machinery.

MAKING GEMS.—A general idea of the process by which MM. Feil and Fremy have succeeded in making real gems has been made public in Paris. The materials used are aluminate of lead and silica. The alumina is crystallized into white corundum, by exposing these substances to a red heat for twenty days. To make rubies, a little bichromate of potash is added; to make sapphires, a little oxide of cobalt. The quality and beauty of natural gems are said to be reproduced in the precious stones thus obtained.

PROSPECTS OF INCREASE OF GOLD PRODUCTION IN CHILI.—We note the statement that the gold fever is spreading in Chili. The excavations at Catapilco seem to have convinced the public that Chili is indeed an auriferous country. A good many companies are forming. Besides the Margamaga Company, another has been started in the Quillote district for the working of the Malacara mine on a more extensive scale. This mine had been worked to advantage on a moderate scale for some years past.

MEETING OF THE INTERNATIONAL UNION.—The miners of Western Pennsylvania met at Elizabeth, Allegheny County, on the 18th instant, to organize an International Union. Joseph Bishop, President of the Amalgamated Association of Iron Workers of the United States, and C. H. Litchman, of Marblehead, Mass., President of the Confederated Unions of America, were among the speakers. The miners also resolved to stand out for two and one half cents per bushel of seventy-six pounds for digging.

NEW APPLICATIONS OF THE ELECTRIC LIGHT.—A correspondent has written to the *Globe*, suggesting the use of the electric light in tunnels. By so doing, he says, the carriages would not require to be supplied with oil or gas, much time and labor would be saved, and a uniform light would be insured, not leaving, as is often the case, part of the train in darkness. The carriages would be cooler and less dirty, the driver would have a clearer view of the line, and the system would be less expensive than that at present in use. From France, we hear of harvest operations being carried on by the same light.

THE COLOR OF METALLIC FILMS.—It is stated that films of gold and other metals can be obtained, by means of electricity, of sufficient thinness to transmit light. The films are obtained by causing electric sparks to pass from wires of the required metals, passing into glass tubes of rarefied air or other gases, when the particles of metal, detached from the wires by the sparks, become deposited on the glass, forming an excessively thin film, quite continuous, it is said, under the microscope. Of the metallic films thus produced gold transmits a fine green light; silver

gives a fine blue color; copper, a dull green; platinum, a bluish-gray; zinc, a deep bluish-gray; iron, a tint nearly neutral, but inclining to brownish; and cadmium, like zinc, a bluish-gray.—*Engineer.*

TO DRILL GLASS.—Glass can be drilled with a common drill very readily, by using a mixture of turpentine and camphor. When the point of the drill has come through, it should be taken out and the hole worked through with the point of a three-cornered file, having the edges ground sharp. Use the corners of the file, and scraping the glass, rather than use the file as a reamer. Great care must be taken not to crack the glass or flake off parts of it in finishing the hole after the point of the drill has come through. Use the mixture freely during the drilling and scraping. The above mixture will be found very useful in drilling hard cast-iron. Tempered steel can be drilled by making the drill very hard and using this mixture.—*Ex.*

COLORADO AGATES.—In a letter from Hot Sulphur Springs, a correspondent of the *Denver News* gives some interesting particulars concerning the agates which are found in the Middle Park. They occur in large patches, scattered over the surface in chips and large fragments, and occurring also in massive ledges. Only a very small percentage of them, however, contain the curious and delicate crystallization of iron known as moss. The great agate field is south of the Grand and west of Williams River on a high sage plain. It is six or eight miles in length, and nearly as great in width, though agates are not found all over this area. It has been culled and picked over by hundreds of people. There is an agate patch, or several of them, small in extent, on the divide between Troublesome River and Corral Creek, north of the Grand. In all these localities the "moss" is black or dark brown—the usual color. Near Grand River, on the north side, and about three miles west of the Hot Sulphur Springs, is a small area where red-moss agates are found—that is, the "moss" is red, or reddish-brown, instead of black. Red moss agates are rare and curious. No search has ever been made in any of these places beneath the natural surface of the ground. The agates gathered have been picked up on the surface, generally broken in fragments, that showed the moss naturally.

ERICSSON'S TORPEDO.—In September this singular craft will be finished and subjected to various tests as to the power of her engines and her adaptation to the torpedo service. Captain Ericsson was found by an *Iron Age* representative at his residence in Beach street, and had evidently been disturbed while at his drawing-board in a retired part of the building. With regard to the torpedo he ventured no predictions, but was emphatic in declaring that the machine, as a device for fighting iron-clads, would be impregnable. Moved by an engine of great power, it would have a velocity surpassing that of any antagonist, and being almost wholly submerged and in perfect control, could advance boldly in the face of the enemy and deliver her missile with destructive effect. Captain Ericsson then spoke of the superiority of his torpedo compared with the Whitehead pattern, which could not be guided with any certainty, and the Lay, which was too much exposed above the surface of the water. He could use either steam or compressed air as a motive power. Although the distinguished inventor declines to speak more in detail at present, it is understood that while his boat does not exceed 120 feet, it will have a pair of 24-inch cylinders, and, judging from former experiments on the Hudson, will be able to propel a torpedo horizontally under water with great velocity, or, if desired, the missile can be given an upward direction, so as to pierce a ship's bottom below the iron plates.

EDMUNDS' PHONOSCOPE.—Mr. W. Ladd read a paper with this title at the Dublin meeting of the British Association, of which the following is an abstract: "This little instrument, the phonoscope, is for producing figures of light from vibrations of sound. It consists essentially of three parts, an induction coil, an interrupter, and a rotary vacuum tube. The action of the instrument is as follows: Sounds from the voice or other sources produce vibrations on the diaphragm of the interrupter, which, being in the primary circuit of the induction coil, induce at each interruption a current in the secondary coil similar to the action of a contact-breaker or rheotone; therefore, each vibration is made visible as a flash in the vacuum tube. This tube revolving all the time at a constant speed, the flashes produce a symmetrical figure like the spokes of a wheel, as in the Gassiot Star. The number of spokes or radii is according to the number of vibrations in the interrupter during a revolution of the tube, and the number of vibrations being varied to any extent, according to the sounds produced, the figures in the revolving tube will be varied accordingly. The same sounds always produce the same figures, providing the revolution be constant. In case of rhythmical interruption being produced in a given sound, as in a trill, most beautiful effects are noticeable, owing to the omission of certain radii in regular positions in the figure. The uses of this instrument are the rendering visible of sounds, and showing the vibrations required in their production, and it forms a mode of confirming by sight an appeal to the ear."

MARKET FOR AMERICAN COAL IN SPAIN.—In answer to coal dealers of the United States, our Consul at Barcelona has communicated to the Department of State an interesting dispatch concerning the feasibility of introducing American coal into that great manufacturing center of Spain. After a careful investigation of the subject, the Consul believes that American coal can successfully compete with the British and find a profitable market in Barcelona. The Consul pronounces our anthracite superior to Cardiff coal for general purposes. Cardiff coal is brought to Barcelona in steamers and sailing-vessels specially built for the purpose. The price of English coal at the date of the Consul's dispatch, August 25th, was \$6.85 per ton. Taking this price into consideration, with the further facts that American steamers would be almost certain to get full return freights from Genoa, Marseilles, Barcelona, Valencia, Malaga, and Cadiz, of wine, fruits, etc., for more than seven months in each year—freight which now reaches the United States via England—besides a good many passengers, who now reach the United States via Havre and Liverpool—the Consul believes that American coal can be sold there and have a fair profit. Besides coal, many other articles would enter into the trade if direct communication could be established. The average price of coal at Barcelona during 1877 was \$7.65 per ton, and the total importation, all from England, 253,174 tons, representing a value of \$1,969,693. The duty on coal at Barcelona is 50 cents per ton, and port charges 65 cents per ton.

and the Sierra Nevada, will open up an immense stretch of the Comstock in which the new ore developments in Ophir and Sierra Nevada have created expectations of the grandest character.

"The repairs to the consolidated shaft are now being pushed steadily forward, the 1500 station having been reached yesterday. The belief has become prevalent that as soon as the repairs to the shaft are completed the mine will be ready to resume the extraction of ore. This is wrong, and needs correcting, as there are hundreds of feet of drifts on the 1500, 1400, and 1300 levels, which have been so crushed during the time occupied in repairing the shaft that it will take months to make the repairs necessary before a successful extraction of the ore can be resumed. California passes its dividend for September.

"Preparations for soon commencing the sinking of the big joint Best & Belcher and Gould & Curry new shaft are nearly completed.

"The Justice and Alta have wisely withdrawn their troubles from the courts, and have settled them by a compromise advantageous to both mines.

"At the Silver Hill the pumping and hoisting machinery has been overhauled, new pumps and rods put in, and the best of preparations made for the speedy opening up of the ore vein on the 900 level.

"Cross-cuts are being run in the Belcher, Crown Point, Imperial, and Alta mines, and developments are likely to be made at almost any hour that may set the south end of the Comstock in as wild an excitement as that now going on at the north end."

DAKOTA.

The following dispatch, dated Deadwood, Dakota Ter., September 18th, confirms the rumors published in our last: "The Palmetto, American Flag, and Old Abe mines, which some time ago were purchased by California parties, were paid for to-day. The Palmetto and American Flag brought \$15,000 each, and the Old Abe, together with all machinery, \$160,000. The treasure-coach, which leaves here to-morrow, will take \$250,000 worth of gold bullion from the hills."

CALIFORNIA.

THE BODIE MINES.

From the weekly review in the Standard of the 11th inst., we extract the following concerning these mines:

"The past week has been distinguished for remarkable activity among the numerous mines and mining locations spotted so thickly over the hills. Some new strikes have been made during the week. We have conversed with many gentlemen, qualified by long experience to judge of the facts, and their opinion is almost unanimous on the point of permanency in the ledges, and of the richness of the rock; the results in dividends are the best proofs. The interest felt in Bodie mines and stocks is on the increase, and a bright and lasting future is fast opening out all along the line. Incorporations are being made so rapidly we can scarce keep track of them, and must request our mining fraternity to look in on us occasionally and leave us such intelligence as may be in their power to give. The leading mines at this writing—for we may be obliged to alter their classification—such as Bodie, Standard, Bechtel, McClinton, Red Cloud, Richer, Sigourney, Black Hawk and others, are all being developed rapidly and with encouraging results. Before winter sets in, there will be a small city of houses covering hoisting engines all along the hill.

"The Burgess winze in the Bodie is down 73 feet; the Burgess south drift is in 93 feet; the Bruce winze is down 25 feet, and the new shaft is down 75 feet. The stopes on the Bruce show no change, all yielding about the same. In the Bruce winze the pay streak is gradually widening and the ore is very fine. The ground is very hard, and, consequently, can not make very rapid advances in sinking. Have stopped sinking the Burgess winze for the present, in order to run the

drift south ahead, and also enable them to stope out from above. The ledge in this drift continues as it has heretofore, mixed considerably with porphyry and occasionally bunches of rich ore. Making good progress in sinking the new shaft and advancing the work as rapidly as the supply of lumber will admit. Mill working well. Every thing about the mine is looking very satisfactory.

"The main shaft of the Standard has reached a depth of 677 feet, and is still in hard rock. The north drift, 300 level, is in 40 feet; progress since last report 19 feet. The ledge is 3 feet wide, of very good ore. Have started cross-cut west from south drift, 450 level, at 730 feet from the incline. This cross-cut, which is in 18 feet in fair blasting ground is being run to cut the West Standard ledge. The drift on the Cook ledge is being steadily advanced; there are about 2 feet of a horse in the ledge, and about 2 feet of very rich ore. Stopes are looking well."

PROPOSALS.

For the benefit of many of our readers, we have compiled, from advertisements in our exchanges, such proposals and solicitations for contracts, etc., as may be of interest. This table indicates the character of proposals wanted, with the full name and address of parties soliciting the same:

Proposals invited for—	Name and address of parties from whom specifications may be had.	Latest date on which tenders will be received.
Dredging at Cambridge, Md.	Wm. P. Craighill, Maj. of Eng'rs, Baltimore, Md.	Sept. 24
Building of screw steamers	John Rogers, Light-House B'rd, Washington, D.C.	" 25
Repairing bridge	F. S. Massey, Com. of City Works, Brooklyn, N.Y.	" 26
Anthracite coal, 1000 tons of steamboat	A. H. Gilman, U. S. Navy Pay Office, New York, N.Y.	" 26
Improvement of Delaware River	J. N. Macomb, Col. of Eng'rs, Philadelphia, Pa.	" 27
Dredging Supperong River, N. C.	Charles B. Phillips, Captain of Engineers, Norfolk, Va.	" 28
Machinery, wood-working	W. W. Williams, Pay Inspector U. S. Navy, Washington, D. C.	" 28
Iron Pivot Bridge	Peter G. Van Alst, Com. Long Island City	" 28
Coal, 300 tons	John S. Gulick, Navy Pay Office, Philadelphia, Pa.	" 27
American hemp	C. J. Emery, Boston, Mass.	" 30
Naval supplies, hardware, bolting, etc.	John S. Gulick, " " Philadelphia, Pa.	Oct. 2
Naval supplies for timber, zinc, lead, linseed oil, and stationary	C. J. Emery, " " Boston, Mass.	" 3
Indian supplies (hardware and agricultural implements) and stock cattle	E. A. Hoyt, Office of Indian Affairs, Washington, D. C.	" 3
Improvement of Cohansey Creek, New Jersey	J. N. Macomb, Col. of Engineers, 1619 Chestnut street, Philadelphia	" 3
Improving the channel at the mouth of Salem Creek, New Jersey	J. N. Macomb, Col. of Engineers, 1619 Chestnut street, Philadelphia	" 3
Railway construction	F. Braun, Secretary of Department of Public Works, Ottawa, Canada	Jan. 1, 1879
Locks and keys for mail bags	D. M. Key, Postmaster General, Washington, D. C.	Mar. 20, "

NOTE.—Fairmount Water Works, Philadelphia.—Chief Engineer McFadden has made a contract with M. Geyelin to increase the pumping capacity of turbine wheel No. 5 1,500,000 gallons per day, at a cost of \$4330.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending Sept. 14th, and years from January 1st:

TONS OF 2240 LBS.	1878.		1877.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	46,584	1,405,158	.....	1,284,546
D. L. & W. RR. Co.	39,915	1,403,264	.....	1,311,352
Penn. Coal Co.	13,817	563,697	3,512	715,612
L. V. RR. Co.	11,130	544,082	6,719	601,785
P. & N. Y. RR. Co.	639	21,185	.....	32,931
C. RR. of N. J.	.....	616,217	.....	868,157
Penn. Canal Co.	11,005	224,698	4,592	234,824
	123,090	4,778,301	14,823	5,048,560
Lehigh Region.				
L. V. RR. Co.	39,435	1,650,833	102,875	2,167,194
C. RR. of N. J.	31,571	871,906	29,342	975,401
D. H. & W. B. RR.	998	21,222	1,519	15,877
	72,004	2,543,961	133,736	3,158,472
Schuylkill Region.				
P. & R. RR. Co.	191,604	3,316,751	182,258	4,536,523
Shamokin & Lykens Val.	24,429	486,604	11,403	423,554
	216,033	3,803,355	193,661	4,960,077
Sullivan Region.				
Sul. & Erie RR. Co.	550	22,111	937	10,900
Total	411,677	11,147,728	343,157	13,178,009
Increase	69,457	.....	.....	.....
Decrease	.....	2,030,281	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

Receipts and shipments of coal at Chicago Ill., for the week ending Sept. 14th, and year from January 1st.

	Week.	Year.
Receipts	46,273	1,154,326
Shipments	8,753	168,369

The increase of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads amounts to 69,336 tons, as compared with the corresponding period in 1877.

Perth Amboy Business:

	Tons.
Received for the week	9,177
Shipped for the week	13,446
On hand Sept. 14th	81,340

Coal Creek Mines, Colorado.—Shipments for week ending Sept. 7th, 927 tons.

The shipments of coal at Cleveland, Ohio, for the week ending Sept. 13th were as follows: Shipped coastwise, 3406 tons; total for year, 91,946 tons; foreign shipments, 8225 tons; total for year, 77,628. Total of coastwise and foreign shipments for week, 11,631; for year, 169,574.

Belvidere Delaware Railroad Report for week ending Sept. 14th:

	Week.	Year.	Year.
Coal for shipment at Coal Port (Trenton)	410	6,606	12,544
Coal for shipment at South Amboy	3,584	327,933	387,046
Coal for distribution	4,090	118,706	125,381
Coal for Company's use	1,629	54,416	48,935

The Production of Bituminous Coal for the week ending Sept. 14th, was as follows:

Tons of 2000 lbs., unless otherwise designated.	Week.	Year.
Cumberland Region, Md.		
Tons of 2,240 lb.	45,304	1,083,611
Barclay Region, Pa.		
Barclay R. R., tons of 2,240 lbs.	6,120	213,006
Broad Top Region, Pa.		
Huntingdon and Broad Top R. R.	3,548	101,175
*East Broad Top	1,025	41,920
Clearfield Region, Pa.		
*Snow Shoe	406	16,711
*Tyrone and Clearfield	26,100	885,906
Allegheny Region, Pa.		
*Pennsylvania R. R.	3,790	142,052
Pittsburg Region, Pa.		
*West Penn R. R.	3,629	129,885
*Southwest Penn. R. R.	430	18,351
*Penn & Westmoreland gas coal, Pa.		
R. R.	12,365	461,160
*Pennsylvania R. R.	12,227	287,860
*For the week ending Sept. 14th.		

The Production of Coke for the week ending Sept. 14th:

Tons of 2000 lbs.	Week.	Year.
West Penn R. R.	1,426	59,908
Southwest Penn. R. R.	16,286	543,699
Penn. & Westmoreland Region, Pa. R. R.	1,784	53,568
Pittsburg, Penn. R. R.	2,483	71,953
Total	21,979	729,122

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Sept. 20, 1878.

Anthracite.

The Anthracite Board of Control held a meeting at Long Branch on the 17th inst., when it was resolved to make the allotment of tonnage for October 1,200,000 tons, and to continue the combination until April 1st, 1879. As it is intended to keep the combination alive, the action of this meeting indicates that the managers of the several companies realize the depressed condition of the trade, and the necessity for

disabusing the mind of the public in the belief that after January 1st there will be lower prices than are now ruling. The business of the present month is more quiet than the most conservative expected, and, although the tonnage will be a small one, yet it is not probable that the very large stocks that existed at the beginning of the month will be lessened much; hence the necessity of a continued curtailment during October to enable the companies to secure the prices that it was thought combination would furnish. It has been more than suspected that one or two of the members of the combination are dissatisfied with the results of that organization, and it was thought that the compact would not be renewed after December 31st. In that event the early months of next year would probably show as low, or even lower prices than have ever been recorded in this market. It would therefore be inexpedient to cause a disruption at a time when there was no business to compete for. Although it was announced that all agreed to the extension of the combination until April 1st, yet the vote of Dr. Linderman who represents the Lehigh Valley interest, needs ratification, his powers only extending to January 1st.

Since the above-mentioned meeting there may have been a little more inquiry on the part of buyers, but there has certainly been but little, if any, increase in the quantity of coal sold. There is a better business doing at retail, and when buyers realize that stocks in first hands will be greatly reduced by the 1st of November, there will likely begin a fair demand, which may, by the latter part of next month, grow into an active trade.

The Delaware, Lackawanna, and Western Railroad Company will sell at auction, next Wednesday, 50,000 tons of coal. For further particulars see announcement in advertising columns.

The production of anthracite coal last week was 411,677 tons, as against 163,444 tons the previous week and 343,157 tons the corresponding week of 1877. The total production from January 1st to September 14th was 11,147,728 tons, as compared with 13,178,009 tons for the like period of last year, showing a falling off this year of 2,030,281 tons.

Bituminous.

The bituminous trade continues to be very dull. With the great depression that has existed in the manufacturing industries an increase of 69,335 tons this year in the Cumberland trade is very encouraging. Although our latest report of the Clearfield business is only to August 31st, yet, in comparison with the like period of last year, it shows a decrease of but 32,293 tons, making an increase of over 37,000 tons for the two leading bituminous districts, while the anthracite loss figures in the millions. Certificates of results of comparative trials of anthracite and bituminous coals by various prominent manufacturers are being steadily collected by the bituminous producers, and some of them are very flattering to bituminous coal, while all allow that there is some economy in its use.

New York.

Wholesale Prices of Bituminous Coal.

Table with columns: DOMESTIC GAS COALS, At the Shipping Ports, Along-side in New York. Lists prices for Westmoreland and Penn., At S. Amboy, Kanawha at Richmond, etc.

MANUFACTURING AND STEAM COALS.

Table listing manufacturing and steam coals from Cumberland at Georgetown and Alexandria, etc.

FOREIGN GAS COALS.

Table listing foreign gas coals from Newcastle, Tyne, Liv. House Orrel, Ince Hall Cannel, etc.

Wholesale Prices of Anthracite Coal for September Delivery f. o. b. at Tide Water Shipping Ports, per ton of 2240 lbs.

Large table with columns: Lump, Steamer, Grate, Egg, Stove, Chestnut. Lists prices for Wyoming Coal, Lehigh Coal, Schuylkill Coal, etc.

* Fifty cents per ton additional for delivery in New York.

† On coal delivered f. o. b. at the Philadelphia and Reading Coal and Iron Co.'s Wharf at Williamsburgh, the current date of harbor freight will be allowed from the prices here given.

Retail Prices.

Table with columns: Anthracite, Bituminous. Lists retail prices for Pittston coal, Lack coal, Liv. House Orrel, etc.

Baltimore. September 17, 1878.

[Specially reported.] Wholesale Prices per ton of 2240 lbs. In cars at Depot N. C. R. R. HARD WHITE ASH, FREE-BURNING WHITE ASH, SHAMOKIN, ETC. Lump and Steamboat, \$3.85 Stove, \$4.25 Broken, 3.85 Chestnut, 3.80 Egg, 4.00

Buffalo. Sept. 17, 1878.

[Specially reported by E. L. HEDSTROM.] Until further notice, the following will be the prices for Scranton, Wyoming, Lehigh, and Blossburg coals, per ton of 2000 pounds, delivered free on board vessels at Buffalo N. Y.:

Table with columns: Lump, Grate, Egg, Stove, Nut. Lists prices for Scranton, Wyoming, Lehigh, Blossburg.

[Specially reported by C. M. UNDERHILL.]

Table with columns: DELIVERED AT, Elmira, Ithaca, Syracuse, Rochester. Lists prices for Lump, Grate, Egg, Stove, Nut.

DELIVERED AT

Table with columns: Oswego, Erie, Buffalo. Lists prices for Lump, Grate, Egg, Stove, Nut.

Cost of coal from Erie, Oswego, Sodus Point or Charlotte for Western market, same as if shipped from Buffalo.

BLOSSBURG COAL. Per ton of 2000 lbs.

Table with columns: By car or boat, In yard, In car, Delivered. Lists prices for Blossburg coal.

[Specially reported by LEE & LOOMIS.] Per ton of 2000 lbs. delivered on cars.

Table with columns: Lump, Run of Mine, Nut, Slack. Lists prices for Connellsville coke, Brookfield Coal, Briar Hill, etc.

Boston. Sept. 17, 1878.

COAL.—The market is not very active, but prices generally continue to be well sustained. The schooner Monroe, from Port Caledonia, C. B., brought 323 tons coal, Darrow, Mann & Co. The schooner Atlantic, from Dorchester, N. B., brought 75 tons coal, D. W. Job & Co. The schooner Ann Eliza, from Pictou, N. S., brought 139 tons coal, F. H. Odiorne. The schooner Lillian, from Port Caledonia, C. B., brought 255 tons coal, Mann & Soule. The schooner Fleetly, from Port Caledonia, C. B., brought 145 tons coal, Darrow, Mann & Co. The schooner Maggie Malvey, from Glace Bay, C. B., brought 450 tons coal, order. The schooner Mary, from Port Caledonia, C. B., brought 171 tons coal, Darrow, Mann & Co. Last week's tonnage of the Philadelphia and Reading was 7250 tons, against 191,298 tons during same week of last year; Pennsylvania Coal Company, 11,244 tons, against 13,831 tons last year.

We quote Boston wholesale prices as follows: Anthracite, broken, \$4.55 Caledonia, \$4.00 " egg, 4.60 Newcastle, 4.00 " stove, 5.00 Cannel, English, 18.00 Franklin, 7.75 " Library, 15.00 Cumberland, 4.50 " Buckeye, 11.00 Clearfield, 4.50 Penn., 5.25 Westmoreland, 5.25 Youghiogheny, 5.25

Chicago, Ill. Sept. 16, 1878.

[Specially reported by Messrs. RENO & LITTLE.] The following are the present prices of coal per ton of 2000 lbs. delivered: Retail prices of coal delivered per ton of 2000 lbs. Lackawanna Stove, \$6.25 Erie and Brier Hill, \$5.00 " Chestnut, 6.00 Wilm'gton & Ill. \$3.00@3.50 " Grate, 6.00 Blossburg, 5.50@6.00 " Egg, 6.00 Piedmont, 7.00

Cincinnati, O. Sept. 17, 1878.

[Specially reported by the Consolidated Coal & Mining Co.] Per bushel of 72 lbs. Retail delivered, Wholesale afloat. Youghiogheny, 11c, 7 1/2c. Camden, 9c, 5 1/2c. Cannel, 17@18c, 13c. Anthracite, delivered, \$7@8 per ton of 2,000 lbs.

Hamilton, Ont. Sept. 16, 1878.

[Specially reported by H. BARNARD.] Retail prices delivered per ton of 2000 lbs. Ser. or Wilkes-B. Grate, \$4.75 Lehigh Lump, \$6.00 " Egg, 4.75 Brier Hill, 5.00 " Stove, 5.25 Massillon, 4.50 " Nut, 4.75 Smithing, 5.50

Montreal. Sept. 17, 1878.

[Specially reported by Messrs. ROBERT C. ADAMS & Co.] Wholesale per 2240 lbs. Scotch Steam, \$3.50 Cape Breton Steam, \$2.75 Pictou, 3.25 Newcastle Smith's, 4.00 Anthracite at retail, per 2000 lbs. delivered. Stove, \$5.50 Chestnut, \$5.00 Egg, 5.15

Indianapolis, Ind. Sept. 16, 1878.

[Specially reported by Messrs. COBB & BRANHAM.] WHOLESALE BITUMINOUS. On board cars, per ton of 2000 lbs. White River, None in market Hocking Valley, 4.20 Brazil Block, \$2.10 Raymond City, 3.40 Highland Grate, 1.85 Youghiogheny, 3.70 Indiana Cannel, 3.65 Blossburg (smithing), 5.25 Peytona, 5.70 Piedmont, 5.25

Per car, 12 tons.

Block coal, nut, \$15.00 Block Slack, \$12.00 Highland, 14.00

RETAIL BITUMINOUS. Delivered per bushel of 70 lbs.

Raymond City, 14c. Block Nut, steam use, 6c. Brazil Block, 10 " Slack, 5 " Highland Grate, 9 " Virginia Cannel, 24 " Block Nut, domestic use, 10 " Indiana Cannel, 15 " Highland Nut, .11 " Youghiogheny, 15 " " steam, 8 " Blossburg, 24

GAS COKE.

Per bushel, measure containing 2888 cubic inches. Retail, crushed, 8c. Wholesale, lump, 6 1/2c. " lump, 7 " crushed, 7 1/2

ANTHRACITE. Per ton of 2000 lbs.

Wholesale on Cars. Retail delivered. Wilkes-Barre, all sizes, \$5.50 Lackawanna, all sizes, \$6.50 Lackawanna, " 5.75 Lackawanna, " 6.50 Lehigh, " 6.75 Lehigh, " 7.50

Louisville, Ky. Sept. 17, 1878.

[Specially reported by Messrs. BYRNE & SPEED.] Please make the following change in prices: Wholesale per bushel of 72 lbs. Pittsburg, 6 1/2c. Kentucky, in river, 5 1/2c. Raymond City, 6 " Kentucky, on cars, 6

Retail.

Pittsburg, 10c. City made Coke, 7c. Raymond City, 9 " Gas Coke, 8c. Kentucky, 8 " Cannel Coal, 17 " Hard Coke, 9 " Anthracite, per ton, \$7.00

Milwaukee, Wis. Sept. 17, 1878.

[Specially reported by Messrs. R. P. ELMORE & Co.] Retail price per ton of 2000 lbs. Lehigh prepared, chippings, \$7.00 " lump, 7.00 Lackawanna prepared (all sizes), 6.00 Briar Hill, 5.00 Steam coals, \$3.75@4.75

New Orleans, La. Sept. 16, 1878.

[Specially reported by Messrs. C. A. MILTENBERGER & Co.] PITTSBURG COAL. At wholesale (by boat-load), 27c per bbl. of 180 lbs. To steamboats, 45c. " " " 45c. " " " 45c. " " " 50c. " " " 50c. In hds. (for shipment), \$5.00 per hhd. from 5 to 6 bbls.

ANTHRACITE COAL. Per ton of 2000 lbs.

At wholesale, \$7.00 to \$8.00. To families etc., 9.00 to 10.00

ST. BERNARD (KY.) COAL.

To steamboats, 40c. per bbl. of 180 lbs. " families, 45c. " " " 45c. Virginia cannel to families, \$1.00 " " "

Philadelphia. Sept. 19, 1878.

The Schuylkill region stopped work yesterday afternoon until October. The small quota fixed by the Board of Contract for next month has caused much comment and was a surprise to every body. The effect of this regulation can be clearly seen. Prices must rise and the consumption decrease, and it must become more and more evident that the increase of price, beyond what the condition of business will bear, is no compensation for the decrease in consumption. It is also very clear that the parties who have large stocks of coal on hand which can be delivered in New York harbor at any time secure to themselves a much better trade in New York during the winter if they can keep away now the Schuylkill coal, which can not reach New York after the close of navigation except at a great disadvantage, and the Schuylkill region will suffer the most from this ill-timed contraction. Many suspect that this motive was at the bottom of the action of some of the New York companies. Whether or not, no one can deny the effect. Those who claim that the Schuylkill quota

is too large and theirs too small, will soon alter their opinion if they consider how Schuylkill has been kept out of the New York market from the beginning of the season by rates of transportation entirely too high when compared to those paid by their competitors, and will be kept out in the busy season by the contraction in the tonnage now taking place, notwithstanding concessions in tolls made a short time ago. September quota had to be made much smaller than it should have been. To decrease so severely the production when purchasers are ready to take considerably more and advance prices is an inconsistency, and an argument greatly against the justice of the combination and which seriously threatens its existence.

No change to report in freights. The amount of coal on hand at Port Richmond is not large and is held at prices which the purchasers are not yet ready to pay.

Pittsburg, Sept. 19, 1878.

COAL.—During the late freshet 5,897,000 bushels, or 222,526 tons, of coal were shipped to Cincinnati and Louisville; also 400,000 bushels, or 8000 tons, of coke was shipped principally to Wheeling and St. Louis. Nothing was sent below the mouth of the Ohio on account of the fever. These shipments made a pretty thorough clearing out of the coal tonnage and tugs remaining in this port at the time of the rise. No change has taken place within the last week in the condition of the coal business in this district. But few of the mines are being worked at present, the greater portion of the miners still standing out for higher pay. Prices are so low that the operators are indifferent about hurrying the preparation of more coal for market, especially if the cost of mining is to be raised above 2 cents a bushel. The strike is for 2½ cents, which the operators do not feel inclined to pay, in the face of the fact that 2 cents is the highest rate paid in the rival coals of West Virginia, whose product is 250 miles nearer the lower markets. This rivalry makes it necessary to reduce cost to the lowest figure in order to continue the competition without positive loss. In the late run several barges were wrecked and lost at the new railroad bridge near Beaver—some six or eight, worth at least \$1600 each. Such casualties are of frequent occurrence, and have to be provided for in a prudent calculation of contingencies in carrying on the business. Quotations remain as they were:

Prices.

Wholesale, on board.... 4 cts. per bushel, \$1.06 per ton.
Retail, delivered..... 6½ cts. " " 1.71 " "

Bushels are rated among dealers here at 76 lbs.—26¼ bushels make a ton, nearly.

The barrel that rules the coal measurement in New Orleans contains 2 4-7 bushels, of 80 lbs. each, making about 206 lbs. Nine and two thirds of these barrels weigh a ton within a small fraction.

(Coke.—The demand for this article comes from sources where business is settled and supplies required in regular quantities. Thus it is likely to remain until a general revival of activity in all industrial departments. Supply and demand are now adjusted to each other, so that the business moves onward with perfect regularity, on prices reduced to the lowest living figures for the manufacturer. The regular trade is carried on by railroad transportation. Shipments by water are but casual outlets, comparatively small in quantity, and do not form an appreciable portion of the consumption. Quotations unchanged. We give them at home rates, in which 40 lbs. make a bushel, and 50 bushels a ton.

Wholesale, per bushel, 4@4½c.; per ton.....\$2.00@2.25
Retail, " " " " 5@5½c.; " " " " 2.50@2.75

The prices at other points where the Connellsville coke goes are the same as here, with the transportation added. Tons in the above tables are of 2000 pounds.—American Manufacturer.

Pittston, Pa. Sept. 17, 1878.

Pennsylvania Coal Company's Coal in Yard.

Retail per ton of 2,000 lb.

Lump, Egg, and Stove.....\$2 25
Chestnut..... 2 00
Pea..... 1 00
Delivered, 50 cents per ton additional.

Richmond, Va. Sept. 17, 1878.

[Specially reported by S. H. HAWES, Dealer in Coal.]

Per ton of 2240 lbs. f.o.b.

Kanawha Cannel.....\$9.00 New River Bituminous \$3.30
Coalburg Splint..... 4.50 Clover Hill Coal..... 2.50
Lewiston..... 4.50 Norwood Gas and
Kanawha Gas Coal..... 4.10 Steam Coal..... 2.70

San Francisco, Sept. 12, 1878.

COAL.—Imports from January 1st to September 1st, 1878:

	Tons.	Tons.
Anthracite.....	9,472 English.....	19,612
Australian.....	90,065 Mt. Diablo.....	65,401
Coos Bay.....	21,677 Rocky Mountain.....	371
Cumberland.....	802 Ione.....	621
Bellingham Bay.....	2,820 Carbondale.....	2,024
Vancouver Island.....	87,780 Unalaska.....	300
Seattle.....	69,645	

The market for all kinds of bituminous is active, and of foreign, we believe, there is but one cargo in port unsold, and it is said that at this writing all the Scotch and West Hartly here and en route is sold. Transactions since our last weekly reference include the Airlie's cargo of 1871 tons Wallsend at \$6.37½; four cargoes Sydney steam, private, but said to be within the range of \$6@6.25; three cargoes of Scotch of favorite descriptions sold upon terms reserved, but supposed to be in the neighborhood of \$7, and the price now advanced to \$7.50@8. The arrivals from British Columbia continue liberal, as is also the case from Seattle mines, and these favorite coals sell as fast as they arrive and at some advance upon the lowest prices of the season. So far as we are advised, there are very few cargoes of Wallsend or Sydney en route that are not already contracted for by the gas company, rolling mills, or by dealers. All kinds of anthracite seem to be neglected, except Lehigh, and even this favorite is in limited request by reason of the few foundries now actively at work. The arrivals during the week embrace the following: From Seattle, El Dorado, 1900 tons; North Bend, 612 tons. At the close we quote cargoes of Scotch splint at \$8; Sydney steam, \$6.25. At the close a spot cargo of Wallsend sold at \$6.50. The bark Oldbridge brought 1217 tons Scotch.—Commercial Bulletin.

St. Louis, Mo. Sept. 17, 1878.

Reported by JAMES J. SYLVESTER, Secretary of the Anthracite Coal Association.

Retail prices, delivered. Ton of 2000 lbs.

ANTHRACITE.

	Per ton.	Per ton.
Lackawanna.....	\$7.50@	Lehigh..... \$8.50@
Wilkes-Barre.....	7.50@	Connells. Coke. 6.00@
Schuylkill.....	7.50@	Blossburg..... 7.75@

Sept. 10, 1878.

[Specially reported by Messrs. LEWIS P. HARVEY & Co.]

BITUMINOUS.

Big Muddy.....	\$3.65	Piedmont.....	\$7.25
Indiana Block.....	3.25	Pittsburg.....	4.35
Illinois Coals.....	2.25@2.50	Peytona.....	7.50
Blossburg.....	7.75	Lehigh Val. Ant. 7.50@8.00	

Toledo, Ohio. Sept. 14, 1878.

[Specially reported by Messrs. GOSLINE & BARBOUR.]
We quote the following as the present prices for coal, delivered on cars here, per ton of 2000 lbs.:

Ton of 2000 lbs.

	Grate.	Egg.	Stove.	Chest.
Pittston.....	\$5.05	\$5.15	\$5.40	\$4.90
Wilkes-Barre.....	5.05	5.15	5.40	4.90
Lackawanna.....	5.05	5.15	5.40	4.90

The remaining grades same as quoted in your last issue, viz.:

Ton of 2000 lbs.

Straitsville lump.....	\$2 60	Massillon nut.....	\$2 40
" nut.....	2 25	Willow Bank lump.....	2 85
Shawnee lump.....	2 60	" nut.....	2 40
" nut.....	2 25	Cumberland.....	5 00
Hocking Valley lump.....	2 60	Blossburg.....	4 60
" nut.....	2 25	Morris Run.....	4 60
Massillon lump.....	2 85	Gas Coal.....	3 30

Retail prices, delivered in the city, are: Stove, \$5.25; Grate, Egg, and Chestnut, \$5.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to Sept. 19, 1878.

PORTS.	From Philadelphia.		From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
	From Philadelphia.	From Baltimore.	
Albany.....		1.55	
Alexandria, Va.....	55@60	60	
Augusta.....	1.30	1.60	
Bangor, Me.....		1.50	87½
Bath, Me.....	1.15@1.20	1.25	85
Baltimore.....	60		
Beverly, Mass.....	1.10	1.25@1.30	85
Boston, Mass.....	85@90†	1.25	90@1.00
Bridgeton, Conn.....	1.27½	1.30	70
Bristol, R. I.....	1.15		85
Cambridge, Mass.....	1.18		85
Cambridgeport.....	1.20		85
Charlestown.....	1.10		85
East Cambridge.....	1.10		85
Fall River.....		1.25	70
Georgetown.....	55		
Hartford.....	1.40	1.25	
Haverhill.....			90
Hoboken.....		1.20	35
Hudson.....		1.40	
Jersey City.....		1.15	35
Lynn.....	1.25		85
Maitland.....			2.25
Milton.....	1.20		
Middletown.....			96
Nantucket, Mass.....			90
New Bedford.....	1.05	1.25	70
Newburyport.....	1.10†	1.45	1.00
New Haven.....	90†	1.25	60
New London.....		1.25	60
Newport.....	1.05		70
New York.....	85@90	1.25	35
Newark.....		1.35	
Norfolk, Va.....	50	45	
Norwich.....	1.15	1.35	70
Norwalk, Conn.....		1.35	55
Pawtucket.....	1.15	1.45	75
Petersburg.....	70		
Philadelphia.....		70	
Portland.....	97½†	1.25	75
Portsmouth, N.H.....	1.20	1.40	1.00
Providence.....	1.05	1.25	70
Quincy Point.....			90
Richmond, Va.....	57@60		
Rockland.....			85
Roxbury.....			95½
Saco.....	1.45		1.05
Salem, Mass.....	1.15@1.28	1.30	85
Somerset.....	1.05		70
Scituate.....			90†
St. John, N. B.....			1.10
Staten Island.....	91		20
Trenton.....		1.70	
Troy.....		1.60	
Wareham.....		1.40	
Washington.....	55	60	
Weymouth.....	1.10		
Williamsburg.....			35
Wilmington.....		70	
Yarmouth, N. S.....			1.25

Perth Amboy to Salem, 95. Perth Amboy to Bangor, 90.
*And discharging and towing. †And discharging. ‡And towing. §3c. per bridge extra. † And pilotage.

Ocean Freights.

Ocean Freights on coal, iron, etc., per ton of 2000 lbs. to and from foreign and domestic ports, for four weeks ending September 19, 1878, are given below.

DATE.	From	To	Cargo.	R'te
Aug. 22	New York.....	Genoa.....	Coal.....	4.00
" 29	Port Johnson.....	St. John, N. B.....	Coal.....	1.00
" 29	Baltimore.....	Kingston, Jam.....	Coal.....	3.50
" 30	Hoboken.....	Charlottetown.....	Coal.....	1.40
Sept. 3	Hoboken.....	Key West.....	Coal.....	2.25
" 5	San Francisco.....	Nanaimo.....	Coal.....	3.00
" 7	Georgetown.....	Aspinwall.....	Coal.....	4.00
" 9	Philadelphia.....	Aspinwall.....	Coal.....	4.00
" 12	New York.....	Yarmouth, N.S.....	Coal.....	1.25
" 13	Boston.....	San Francisco.....	Iron.....	9.00
" 13	Wood's Dale.....	Philadelphia.....	Guano.....	1.00
" 14	Piermont.....	Baltimore.....	Iron ore.....	80
" 17	Baltimore.....	Trinidad.....	Coal.....	3.00
" 17	New York.....	Alexandria.....	Ph'sp'te.....	90
" 17	New York.....	Baltimore.....	Ph'sp'te.....	90

Sandusky, Ohio. Sept. 17, 1878.

[Specially reported by Messrs. BLACK & CLARKE, Agents Con Coal and Mining Company.]

Per ton of 2000 lbs.

ANTHRACITE.

	Grate.	Egg.	Stove.	Chest.
Lehigh.....	\$6 00	\$6 00	\$6 25	\$5 75
Wilkes-Barre.....	4 80	4 90	5 15	4 65
Pittston.....	4 80	4 90	5 15	4 65

BITUMINOUS.

Massillon.....	\$2 85	Straitsville.....	\$2 50
Hocking Valley.....	2 50	Piedmont.....	4 10

Prices retailed delivered 50c. @75c. above car prices.

IRON MARKET REVIEW.

New York, Friday Evening, Sept. 20, 1878.

American Pig.—There has been a larger business than usual during the past week. It has, however, been largely speculative, the iron having been bought because it was cheap. We are reported the following sales of North River iron: 3000 tons of Gray Forge, 1000 tons of No. 1 Foundry, and 1500 tons of No. 2 Foundry. The terms of these sales are kept private, but of the above lot we learn that 500 tons of No. 2 Foundry sold at \$14.15 per ton. In addition to the above-mentioned sales there has been a liberal business in a small way, but at very low prices, especially for the North River irons. This is so much the case that Lehigh irons are unmarketable at the general asking prices, except in a few instances, where that class of iron must be used. The outlook for the iron trade continues to be very discouraging for at least the balance of the year. There is hardly a case where the furnace companies are not losing money. We quote No. 1 Foundry at \$16@18; No. 2 Foundry, \$15@17; and Forge, \$14@16.

Scotch Pig.—There have been arrivals of 300 tons during the week, and sales to arrive of 200 tons, brand and price not revealed to the public. Outside of this sale there has been only a small retail business. We quote Eglinton at \$21.50@22.50; Glengarnock, \$23@24; Coltness, \$23.50@24.50.

The stock of iron in Connal & Co.'s stores continues to increase. According to the circular of Messrs. John E. Swan & Bros., of Glasgow, dated September 6th, it amounted to 192,184 tons, against 158,701 tons a year previous. The number of furnaces in blast was 92, against 87 at the corresponding time in 1877. The shipments are improving, although they show a large decrease for the whole year. Up to August 31st they were 262,806 tons, as compared with 315,762 tons to the same date in 1877, showing a falling off this year of 52,956 tons. The imports of Middlesbrough pig-iron to August 31st show an increase of 7542 tons over those to same date in 1877. The following were the quotations of No. 1 Scotch iron: Gartsherry, 55s.; Coltness, 57s. 3d.; Summerlee, 58s.; Langloan, 56s.; Glengarnock, 53s. 6d.; and Eglinton, 48s. 6d. Middlesbrough pig was quoted as follows: No. 1 foundry, 42s. 6d.; No. 2, 40s. 6d.; No. 3, 39s.; No. 4, 38s. 3d.; No. 4 forge, 38s. Bessemer iron, f. o. b., Barrow, was quoted as follows: No. 1, 65s.; No. 2, 62s. 6d.; No. 3, 60s.

Rails.—There is quite a large business reported in steel rails. The Atchison, Topeka, and Santa Fe Railroad is reported to have purchased at Chicago 10,000 tons. The Cincinnati Southern is said to have contracted with the Edgar Thomson Steel Works for enough rails to complete the road, and about 2500 tons have been sold in lots here at \$45, delivered at tide-water. There is a fair inquiry in a small way for iron rails. We quote steel rails at mill at \$42@45 and iron at \$32@36.

Old Rails.—Without business, we quote nominally at \$17@18.

Wrought Scrap.—We are reported a sale of 250 tons on private terms, and quote at \$21 from yard.

Baltimore, Sept. 16, 1878.

[Specially reported by Messrs. R. C. HOFFMAN & Co.] The iron market remains about same as last report, with fair demand. Prices about as follows:

Table listing iron products and prices in Baltimore, including Bail. Char., Va., Anth. No. 1, and Ref'd Blooms.

Buffalo, Sept. 13, 1878.

[Specially reported by Messrs. PALEN & BURNS.]

Table listing iron products and prices in Buffalo, including Foundry, Forge, and Bessemer Iron.

Chattanooga, Sept. 16, 1878.

[Specially reported by J. F. JAMES, Dealer in Iron & Metals.]

The entire trade South has been dull during the past week. The continuance of the yellow-fever plague at most of the important cities South and Southwest has put a stoppage to all shipments in those directions.

Table listing iron products and prices in Chattanooga, including Tenn. Ala. & Ga. Charcoal, No. 1 Foundry, and Old rails.

IRON ORES.

Red hematite or fossiliferous f. o. c. at mines, about 55 per cent metallic iron... \$1.25

Cincinnati, O., Sept. 17, 1878.

[Specially reported by Messrs. TRABER & AUBERY, Commission Merchants for the sale of pig iron, blooms, ore, etc.]

Below please find closing quotations of our pig-iron market, viz.:

Table listing iron products and prices in Cincinnati, including Charcoal, Stone Coal, and Coke.

Table listing iron products and prices in Ohio & W. Va., including Foundry, Stove, and Mill.

CAR-WHEEL.

Table listing iron products and prices in H'n'g R., C. B., including Hecla, Vesuvius, Jefferson, and Cedar Point.

BLOOMS.

Table listing iron products and prices in Charcoal, including \$45 00@50 00-cash.

SCRAP IRON.

Table listing iron products and prices in Cast and Wrought scrap.

Columbus, O., Sept. 17, 1878.

[Specially reported by Messrs. KING, GILBERT & WARNER, Dealers in Pig Iron and Ores.]

The pig-iron trade remains in about the same condition as last week. We note no decided improvement in prices as yet, although there is a feeling that all grades will command better prices this fall.

The usual time, four months, allowed on quotations.

Table listing iron products and prices in Columbus, including Foundry Irons, Mill Irons, and Scrap Iron.

Cleveland, O., Sept. 17, 1878.

[Specially reported by Messrs. C. E. BINGHAM & Co.] Per gross ton, on four months' time. Subject to change without notice.

FOUNDRY IRON.

Table listing iron products and prices in Cleveland, including L. S. Charcoal, Anthracite, and Bituminous.

CAR-WHEEL AND MALLEABLE IRON.

Table listing iron products and prices in Cleveland, including L. S. Charcoal and Bessemer Iron.

BESSEMER IRON.

Table listing iron products and prices in Cleveland, including L. S. Char. and Forge Iron.

LOUISVILLE, KY., Sept. 17, 1878.

[Specially reported by Messrs. GEORGE H. HULL & Co.]

The market is firm at full figures. Most of the furnaces South are sold ahead of their product, and have advanced another half dollar.

The usual time, 4 months, allowed on quotations below:

Table listing iron products and prices in Louisville, including Foundry Irons and Hanging Rock Charcoal.

MILL IRONS.

Table listing iron products and prices in Louisville, including Charcoal, Cold-short & Neutral, and White & Mottled.

CAR-WHEEL AND MALLEABLE IRONS.

Table listing iron products and prices in Louisville, including Hanging Rock, Cold Blast, and Kentucky, Cold Blast.

MILWAUKEE, WIS., Sept. 17, 1878.

[Specially reported by Messrs. R. P. ELMORE & Co.]

CHARCOAL IRON.

Table listing iron products and prices in Milwaukee, including Lake Superior per gross ton.

ANTHRACITE IRON.

Table listing iron products and prices in Milwaukee, including Anthracite per gross ton.

STONE COAL AND COKE.

Table listing iron products and prices in Milwaukee, including Warner's Am Sc'h and Soft Silvery per ton.

CAR WHEEL.

Table listing iron products and prices in Milwaukee, including Lake Superior ores per ton.

PITTSBURG, PA., Sept. 17, 1878.

[Specially reported by A. H. CHILDS.]

Table listing iron products and prices in Pittsburgh, including F'dry, Hot Blast Ch., and Cold Blast W.

RICHMOND, VA., Sept. 17, 1878.

[Specially reported by ASA SNYDER, Esq.]

Liberal sales the past week of foundry grades of pig-iron, and considerable inquiry for old rails, on basis of quotations.

Table listing iron products and prices in Richmond, including Amer. Scotch Pig Iron, Anthracite, and Coke.

ST. LOUIS, MO., Sept. 17, 1878.

[Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of iron.]

COLD BLAST CHARCOAL—ALL NUMBERS. Hanging Rock, Tennessee, Kentucky, Missouri, Georgia, Alabama.

Table listing iron products and prices in St. Louis, including Missouri stone coal, Tennessee charcoal, and Hanging Rock charcoal.

METALS.

NEW YORK, Friday Evening, Sept. 20, 1878.

Among the trade, business is still pronounced "quiet," but there is certainly much more doing than thirty days ago. It has increased in a quiet way, and, as there is but little if any profit in the business doing, dealers are inclined to grumble.

Messrs. Vivian, Younger & Bond, of London, under date of September 6th, say: "The past month has developed a marked decline in the prices of the leading metals."

RECEIPTS OF METALS AT NEW YORK FOR THE FOUR WEEKS ENDING SEPTEMBER 19TH AND YEAR FROM JANUARY 1ST, 1878.

Table showing receipts of metals at New York for the four weeks ending Sept 19 and year from Jan 1, 1878.

Gold Coin.—During the week under review the price of gold has ranged from 100 3/4 to 100 1/2, and closed at 100 1/2.

Copper.—The business in ingot has been confined to small lots, at 16@16 1/2c., according to quantity. These are the closing prices, there being no quotations at less than 16c.

The stock of copper in first hands in Europe and Chili copper, shipping and afloat, as per mail advices Sept. 1st, 1876, was 30,221 tons. At the same date this year, the amount had increased to 44,101 tons, or over 45 per cent.

A London correspondent, under date of the 6th inst., says:

"Chili bars continue to be offered at low figures, but the parcels on sale at the market quotations are mostly held in second hands; for, at present figures, the majority of the importers decline to sell, and, in fact, the bulk of the stock can not be obtained at anything approaching to current values."

On the 7th inst. 50 tons of Chili copper G. O. B.s sold in London at 59 1/2s. 6d., cash.

Our correspondent, under date of the 10th, says:

"Chili bars are a trifle steadier, and closed this afternoon with a slight tendency to better prices, the improvement however, being scarcely sufficient to cause any actual alteration in the market quotations."

Tin.—There have been sales here of 1000 slabs at 13½@13¾c., cash, and 500 slabs, in lots of 100 pigs, at 13¾c.; 5 tons of L. & F. at 13¾c., and small lots of Banca at 17c. The Singapore quotation for Straits tin is \$17.70, and in London £57 10s., with an upward tendency. The shipments from the Straits for the first half of September to the United States were 30 tons, and to Great Britain 130 tons. The total shipments from January 1st to September 15th were: To the United States in 1878, 2590 tons, and in 1877, 2375 tons; to Great Britain in 1878, 2247 tons, and in 1877, 1793 tons. The arrivals during the week have been 639 piculs, and advices are received of 150 tons of Australian shipped. The Glamis Castle, with 200 tons of tin, is nearly due. Upon the spot, 13¾c. is bid and 13½@13¾c. is asked for Straits; to arrive, 13c. is bid and 13½@13¾c. asked. L. & F., in five-ton lots, is held at 13¾c., with 13½ bid. Refined is very quiet and quite nominal. Banca is steady at 17c. A very fair business is expected. A correspondent, writing us from London under date of the 10th inst., says:

"Although a small lot of Australian, for delivery any time this year in seller's option, was disposed of at 56½s., yet, for available metal (30 tons), 57s. was paid, and, for delivery end October (20 tons), fetched 57¼@57½s."

Tin Plates.—There is a good jobbing trade for all kinds, and prices are a little stronger. There is a very good inquiry from the West for October delivery. We note a sale of 1500 boxes of coke tins, B. V. grade, at \$4.62½ cash, and 500 boxes at \$4.65. \$4.70 is now asked, but they can be bought to arrive at \$4.60. We quote per box as follows: Charcoal bright ½ X, Melyn grade, \$5.80@5.87½, and Allaway grade, \$5.62½@5.75; charcoal ternes, Allaway grade, \$5.35; coke bright, 14×20, B. V. grade, \$4.70, and coke roofing, 14×20, \$4.70.

Messrs. Robert Crooks & Co., of Liverpool, under date of Sept. 5th, say of tin and ternes plates:

"Coke tins at date are completely demoralized by the pressure to sell a large stock of a local speculator. The effect of a sale some 6d. or 9d. below makers' prices will keep the market depressed for some time, and this same result will be helped by the considerable losses several of our manufacturers have incurred by the failure. Charcoal tins and ternes are hardly affected, and are held for much higher figures comparatively. Demand all round is extremely light."

Lead.—Last week there were sales aggregating 300 to 400 tons, and although we knew that they had been made, yet we were unable to learn particulars. The price at which this lead was sold is still kept private. There have been this week 250 tons sold at 3¾c. The market closes at 3-37½@3-40c. The steadily increasing stocks and continued large production are not conducive to the great advance that some of the Western producers said would take place when the resources of the Leadville district were truly known. The article has certainly had no enemies for a long time, and strong bull efforts have been put forward, but all to no avail. As we predicted, the price of lead appears doomed to keep within close range of the export price.

The shipments of lead from Great Britain to China for the first eight months of 1878 were 7335 tons, against 10,149 tons for the like period of 1877. The shipments to Japan for the same periods were 854 and 1384 tons, respectively.

The San Francisco *Commercial Herald* of September 12th says: "The steamship Georgia, for New York, via Panama, carried 160,000 lbs. pig-lead and 440 lbs. base bullion."

Spelter and Zinc.—Although spelter is very quiet, yet it is strong at 5c. Sheet zinc is dull and unchanged in price, being quoted at 5¾c.

Antimony.—Cookson's, although being imported freely, is absorbed about as rapidly as it comes in. The present quotation is 12¼@12½c. Hallet's is quoted at 12c., and is in light stock.

Quicksilver.—The San Francisco *Commercial Herald* of September 12th says: "There appears to be no Eastern and a very trifling export demand. Stocks seem to be accumulating. Last week we noted a contract sale of 1000 flasks at 40c. To-day's price in lots can not be quoted better than 41½c. and at which sales are reported of 300 flasks."

Bullion.—The market for silver closes at about the rates of last week, both abroad and here, without a single feature of importance, or any indication of higher figures. If any thing, still lower rates are probable. The London quotation is 51½d., while in this city the quotation is 112½, and in San Francisco 12 per cent discount.

BULLION SHIPMENTS.

We give below a statement showing the latest bullion

shipments in addition to those announced in our issue of Sept. 14th:

Sept. 4, California,	Nevada.....	\$97,650.82
" 4, Con. Virginia,	"	87,409.10
" 6, Northern Belle,	"	9,115.72
" 10, Manhattan,	"	11,100.00
" 6, Bodie,	California	27,200.01
" 9, Standard,	"	43,975.82
" 9, Christy,	Utah.....	4,975.00
" 12, Ontario,	"	49,787.34
" 10, Hackberry,	Arizona.....	5,852.01

The Blue Banks Mine, Cal., at a clean-up recently, got bullion to the amount of \$16,000.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	LONDON		DATE.	N. Y.	
	Pence.	Cents.		Pence.	Cents.
Sept. 14....	51½	112½	Sept. 18	51 9-16	112½
Sept. 16....	51½	112½	Sept. 19	51 9-16	112½
Sept. 17....	51½	112½	Sept. 20	51 9-16	112½

The Carson Mint Coinage.—Superintendent Crawford, of the United States Mint, at Carson, Nev., furnishes a statement of the August coinage, which compares as follows with that for the same month last year:

August, 1877	\$533,720
August, 1878 (Standard Dollars).....	310,000
Decrease for 1878	\$223,720

Since the re-opening of the Carson Mint, in July, only standard dollars have been coined. The total for the first two months of the current fiscal year is \$419,000, against \$721,720 for the same time in 1877. The Carson Mint commenced coining standard dollars simultaneously with the San Francisco Mint on the 17th of April, and the total to September 1st is as follows:

	San Francisco.	Carson.
April	\$190,000	\$270,000
May	1,500,000	701,000
June	862,000	143,000
July	700,000	109,000
August	1,664,000	310,000
Total	\$4,916,000	\$1,533,000

The Trade vs. the Legal Tender Dollar.—The *Evening Post* says: "Something should be done respecting the 'trade dollar,' which contains 420 grains of silver, or 7¼ grains more than 'the dollar of the fathers,' which is a legal tender. At present the government is in the singular position of refusing to take the 420-grain dollar, and yet enforcing the acceptance of the 412½-grain dollar. If our memory is correct, about \$35,000,000 of 'trade dollars' have been coined, and all have been sent to Asia, or out of the country, except (according to estimates) \$3,000,000 to \$5,000,000. If the Treasury should order the exchange of 412½-grain legal-tender dollars for 420-grain 'trade dollars,' the holders of the latter would get something they could use, and the Treasury would make by the exchange of each dollar 7¼ grains of silver. Of course none of the 'trade dollars' out of the country would come back here for such an exchange, for no one outside of the domain of the United States would care to exchange 420 grains of silver for 412½ grains, the legal-tender function of the latter being of account only within the United States. Such an exchange of 412½-grain legal-tender dollars for 420-grain 'trade dollars' would practically be a purchase of silver bullion by the Treasury with silver dollars."

A Uniform Coin for Great Britain and the Colonies.—The leading minds of Great Britain are contemplating a plan and a financial policy that shall give a uniform currency at home and throughout all England's colonies. As things are now, Canada has her own money and adopts the system of United States dollars and cents; India has her system of rupees and annas; Ceylon the same; Africa uses Dutch and English coins together; Cyprus will afford another variety. It is thought that a system of coinage for the different colonies can be effected that will enable pieces to circulate at a standard value all over Europe without depreciation. The advantage on all hands can be readily seen, and is admitted. The gold coins from the Sydney (Australia) mint have recently been received as legal-tender in England.

Silver Bullion Exports from San Francisco.—We note the statement that the exports of silver bullion from San Francisco during the month of August were the lightest since May, 1876. According to the returns published, the amount of silver produced by thirty-three mines during the fiscal month ending from the first to the 15th of August was \$1,483,355, while the amount actually exported in August was only \$148,944, showing a surplus of \$1,334,000, equal to upward of 1,000,000 ounces. It should also be remembered that the yield of silver last month was the smallest this year. The reason for it is found in the liberal purchase of New York exchange from the government, and in the use of silver certificates. It is known that in July and August the San Francisco banks bought about \$3,000,000 of gold coin exchange on New York from the Treasury Department. It is also known that during the same interval about \$3,000,000 in silver certificates have been sent forward from San Francisco to New York in lieu of coin. These two elements, in connection with low rates of exchange on China are at the bottom of the light amount of treasure shipped from San Francisco last month.

The Nevada Bank sold the government during the week one million ounces of silver at the equivalent of the London rate.

Circulation of Foreign Coins in the United States.—The *Washington Star* says: "Section 3584 of the Revised Statutes, declaring that 'no foreign gold or silver coin shall be legal tender in the payment of debts,' besides reducing the Mexican dollar to its mere value as bullion—about 89½ cents—also reduces a number of other foreign coins which have attained a greater or less circulation in this country. The Mexican dollar, however, has a much greater circulation here than any other foreign gold or silver coin. The other coins affected and cut off are Canadian silver 50-cent, 25-cent, 20-cent, 10-cent and 5-cent pieces; English fractional silver—shillings and sixpences—and a limited number of German, French, and South American pieces. Next to the Mexican dollar, there are more Canadian than any other foreign coins in circulation in the United States. A large number of them, of the various denominations mentioned above, pass readily in New England and along the northern border, and in most of the Western States, at their face value. Legally they are not worth near so much. The Canadian 50-cent piece is worth, as bullion, only about 39½ cents, the 25-cent piece only 19½ cents, and the other pieces in proportion. The English shilling

is the third in point of circulation of foreign coins in this country. It has been brought over by emigrants or came down through Canada. It passes for 25 cents. It is worth only about 19 cents. The French, German, and South American gold and silver in this country came through the agency of emigrants. Its quantity is very small."

FINANCIAL.

New York Stocks.

New York, Friday Evening, Sept. 20, 1878.

The course of the quotations of Coal stocks for the week, up to the closing of the market yesterday, manifested a gradual improvement. The list closes lower to-day, but generally in advance of the prices recorded in our last. The sales reach 96,000 shares. Delaware, Lackawana, and Western stock has ranged from 52 to 54, and closes at 53½, the sales amounting to 84,885 shares.

The *Graphic* says: "The Delaware and Lackawanna Railroad Company has begun a suit against the suspended Oxford Iron Company to recover \$398,000 due for freight charges. A fortnight ago the officers of the Lackawanna Company declared that this concern did not owe them a cent, except what was fully secured."

The stock of the Delaware and Hudson Canal Company has been but sparingly dealt in, the sales reaching only 1163 shares, the final price of 50¼ being a slight advance on the quotation of a week ago. The dealings in the stock of the New Jersey Central Railroad Company amount to the respectable total of 10,373 shares, the final price of 37¼ showing a gradual advance during the business of the week and an improvement of over 3 per cent compared with our last.

The United New Jersey R. R. and Canal Co. has declared its usual quarterly dividend of 2¼ per cent, payable October 10th.

Miscellaneous Stocks and Quotations.

Sales and quotations of the stocks and bonds dealt in here, at Philadelphia and Baltimore for the week ending the 20th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.	Par Value.	High'st	Lowest	Closing	Sales : Shares.
American Coal Co.	\$25	.....	.....	30	.....
St. L., I. M. & S. R. Co.	100	6	5	59½	225
Spring Mt. Coal Co.	50	.....	.....	50	.....
*Cambria Iron Co.	50	.....	.....	55	.....
*Penn. Salt Mfg. Co.	50	.....	.....	70	.....
*Westm'land C. Co.	50	.....	.....	55	.....
*Buck Mt. Coal Co.	50	.....	.....	36	.....
*Schuyl. Nav. Co.	50	.....	.....	.....	.....
*B. & O. RR. Co. 1st pf	100	.....	.....	85	10
*B. & O. RR. Co. 2d pf	100	.....	.....	85	80
*" " " com	90	93½	93	93	.....
*George's Ck. C. Co.	100	.....	.....	86½	.....
*S. Clara Mfg. Co.	100	.....	.....	25	.....
*Atlantic Coal Co.	10	.....	.....	1.15	.....

BONDS.	Princ'l. When Due.	Int' est. When Due.	High'st.	Lowest	Amount.
D., L. & W. 7s, conv	1892 J. & D.	.....	103	.....	10,000
" " " 2d mtge.	1881 M. & S.	.....	103	.....	1,000
N. J. C. 1st mtge. new	1890 F. & A.	.....	113½	.....	1,000
" " " 1st mtge. con	1899 Q. & A.	.....	71½	.....	*108,000
" " " convt.	1902 M. & N.	.....	71½	69	*18,000
Lehigh & W. B. con	1899 Q. & A.	.....	48½	.....	*10,000
Am. Dock & Imp. 7s	..... J. & J.	.....	57	.....	1,000
St. L. I. M. & S. 1st mt	1892 F. & A.	.....	103½	103	13,000
Ches. & O. 1st mtge	1899 M. & N.	.....	.....	26	.....
D. & H. C. Co., 1st mt	1884 J. & J.	.....	.....	.....	.....
" " " " "	1891 J. & J.	.....	101	.....	8,000
" " " " m. loan cp	1894 A. & O.	.....	102½	.....	4,000
" " " " rg.	1894 A. & O.	.....	100½	.....	.....
" " " " new mtge.	.....	.....	.....	.....	.....
*I. V. R., 1st m. 6s. cp.	1898 J. & D.	.....	111	.....	.....
" " " " " "	1898 J. & D.	.....	111½	.....	.....
" " " " 2d m. 7s. rg.	1910 M. & S.	.....	113½	.....	.....
" " " " con. m. 6s. rg.	1893 J. & D.	.....	98½	.....	12,000
" " " " " "	1923 J. & D.	.....	98½	.....	3,000
*Pa. RR., 1st m. 6s. cp.	1880 J. & J.	.....	104½	104½	3,000
" " " " " "	1910 J. & J.	.....	107½	107½	2,000
" " " " " "	1910 A. & O.	.....	109½	.....	5,000
" " " " con. m. 6s. rg.	1905 Q. & A.	.....	93½	.....	.....
" " " " " "	1905 J. & D.	.....	95	.....	17,000
" " " " new loan, 5s	.....	.....	.....	.....	.....
*P. & R. R., 1st m. 6s.	1880 J. & J.	.....	104	.....	.....
P. R. C. 43-44 .....	.....	.....	.....	.....	.....
P. & R. R., 1st m. 6s.	1880 J. & J.	.....	.....	.....	.....
P. R. C. 48-49 .....	.....	.....	.....	.....	.....
P. & R. R., 2d m. 7s cp	1893 A. & O.	.....	113	.....	3,000
" " " " scrip	1882 J. & J.	.....	52	50	1,540
" " " " in. m. 7s. cp	1896 J. & D.	.....	.....	.....	.....
" " " " c. m. 7s. cp.	1911 J. & D.	.....	102½	.....	.....
" " " " " "	1911 J. & D.	.....	102½	.....	1,000
" " " " cvt. 7s. rg.	1893 J. & J.	.....	.....	.....	.....
" " " " C. & I. Co., Deb	.....	.....	.....	.....	.....
7s. R. C.	1892 M. & S.	.....	.....	.....	.....
& R. C. & I. Co., m.	.....	.....	.....	.....	.....
7s. R. C.	92-3 various	.....	.....	.....	.....
L. Nav. Co., 6s. rg. m.	1884 J. & Q.	.....	106	.....	200
" " " " " "	1897 F. & A.	.....	105½	105	2,200
" " " " " "	1894 M. & S.	.....	95	.....	4,000
" " " " " "	1897 J. & D.	.....	95	.....	1,000
" " " " " "	1911 J. & D.	.....	70	.....	.....
*P. & N. Y. C., 7s. R. C.	1896 J. & D.	.....	115½	.....	2,000
" " " " " "	1906 J. & J.	.....	.....	.....	.....
*Pa. Canal, 6s. cp.	1910 J. & J.	.....	60	.....	.....
*Schuyl. Nav., 1st m.	.....	.....	.....	.....	.....
6s. rg.	1897 M. & Q.	.....	89½	.....	.....
*Sus. Coal, 6s. rg.	1911 J. & J.	.....	101½	.....	.....
*Balt. & O. RR., 6s.	1880 J. & J.	.....	101½	.....	.....
" " " " " "	1885 A. & O.	.....	104	.....	.....

Total transactions for the week.....\$229,940

* Assessed.

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

COAL STOCKS.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val), ASSESSMENTS (Total lev'd to date, Date and amount per share of last, Total paid to date), DIVIDENDS (Last Dividend, Rate per Ann.), HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE (Aug. 14, Sept. 16, Sept. 17, Sept. 18, Sept. 19, Sept. 20), SALES.

GENERAL MINING STOCKS.

Dividend Paying Mines.

Table listing various mining companies (e.g., American, Belcher, Bobtail, etc.) with columns for company name, location, capital stock, shares, assessments, dividends, and sales data.

Non-Dividend Mines.

Table listing various mining companies (e.g., Allouez, Alpha, Am. Flag, etc.) with columns for company name, location, capital stock, shares, assessments, dividends, and sales data.

a. Gold. s. Silver. L. Lead. c. Copper. * Non-Assessable. + A dividend of 3% per cent. was declared on the preferred stock of this Co. in July, 1878.

Total Assessment levied to date 52,528,240 Total Sales of Coal Stocks for the week 158,856 shares
Total Mining Dividends to date 230,275,332 Total Sales of Mining Shares for the week 162,710 "

Philadelphia Stocks.

PHILADELPHIA, Friday Evening, Sept. 20, 1878.
The coal shares sold on the Philadelphia market during the week just closed amount to about 60,000 shares. The prices have been somewhat irregular. Lehigh Coal and Navigation stock is lower than quoted a week ago, and has been but sparingly dealt in, while Lehigh Valley stock shows a slightly upward tendency from last week's prices, but closes weak on the quotations recorded. Pennsylvania R.R. shows rather the best improvement of any stock in the list, the sales reaching over 43,000 shares, the stock touching 34% on the 18th inst., equivalent to 68% per cent. It has lost part of this, however, closing to-day at 33%. The stock of the Reading Co. is lower, closing at 15%, with sales amounting to 13,397 shares.

Gas Stocks.

NEW YORK, Friday Evening, September 20, 1878.

There is nothing new to report from last week's issue, the market remaining dull, with no prospect ahead, but that of a decline.

The Citizens' Gas Company, of Frederick, Md., has commenced the erection of works to supply that city with petroleum gas. It is expected that the new gas will be supplied to customers about the 1st of November.
Reductions in the Price of Gas Abroad.—From the London Gas-Trade Circular and Review of August 30th, 1878, we take the following, from which it will be seen that the demand for cheaper gas is not confined to this country alone:

"The following reductions in the price of gas per 1000 cubic feet are announced: Cheadle, 6s. to 5s. 3d.; Clitheroe, 5s. to 4s. 6d., from July 1st last, with a discount of 4d. per 1000 feet, if paid within 31 days; Faversham to 4s. from July 1st last, and 3d. discount for prompt payment; Grantham, 4s. 2d. to 3s. 9d.; Ripon, 4s. 7d. to 4s., from July 1st last."

The Electric Light for the New York City Parks.—The Park Commissioners now contemplate using the electric light to illuminate the public squares of the city. After the hand and torch of Bartholdi's Statue of Liberty were placed in Madison Square, President Wenman desired to make the torch more attractive by means of a powerful light. Inquiries with this object led him to believe that the entire square could be lighted much more brilliantly, and with great saving in expense, by the electric light. Mr. Van Riper, engineer of the Park Commission, has been engaged in studying the use of electricity for illuminating purposes, and has reported in favor of having a trial of the electric light made this season. Several electric lamps are to be set up in Madison Square before the foliage of the trees disappears. Exactly what effect the green leaves and grass will have on the light, can not be determined except by actual trial. If most of the light is absorbed, not less than fifteen electric lamps will be needed to furnish the amount of illumination required. The electric light resembles solar light more than do any of the other lights now in use. This fact leads to the belief that the foliage of the park will reflect a considerable portion of the light, and that five electric lamps will furnish all the illumination desired. Should the trial of the electric light in Madison Square be satisfactory, it is probable that electric lamps will be placed in Union Square and at the skating pond in Central Park.

The cost of the electric light which has been in use for some time past at Manhattan Beach is stated as under: "A ten-horse-power Baxter engine is used to drive three magneto-electric machines. Less than a ton of coal, costing \$4.50, is used in a week to run the machines. The carbon points cost about \$2 per week, and a boy is engaged at \$4 per week to clean the lamps and keep them in order. Altogether the expense is a trifle over \$10 a week for maintaining a light equal in brilliancy to the combined light of 3000 ordinary street lamps—supposing a gas jet to equal fifteen candles in power."

Washington Gas Co.—50 shares of this stock sold in Philadelphia during the week at 16.

AUCTION SALES.—Harlem Gas-Light Co.—10 shares at \$44 per share.

Metropolitan Gas-Light Co.—15 shares at \$131 per share.
The following list of Companies in New York and vicinity is corrected weekly by GEORGE H. FRENZISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York:

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS.			QUOTATIONS.		
			Rate per ann.	Am. of last.	Date of last.	Bid.	As'd	
Mutual, N. Y.	5,000,000	\$100	P. ct.	6	1 1/2	July, '78	74	*76
" Bonds.	30,000	1,000	6	3 1/2	Aug., '78	.....	102	.....
N. York	4,000,000	100	8	4	May, '78	.....	92	.....
Metrop.	2,500,000	100	10	5	Aug., '78	129	135	.....
" Certifs.	1,000,000	.....	7	3 1/2	'78	100	103	.....
Harlem	1,850,000	50	6	3	Feb., '78	60	80	.....
Manhat	4,000,000	50	.....	5	May, '78	180	190	.....
Brooklyn, Bkln.	2,000,000	50	15	5	Apr., '78	145	157	.....
Nassau	1,000,000	25	.....	3	July, '78	73	77	.....
" Certifs.	700,000	1,000	7	3 1/2	May, '78	90	97	.....
People's	1,000,000	100	.....	3 1/2	Jan., '78	20	30	.....
" Certifs.	300,000	1,000	7	3 1/2	July, '78	75	85	.....
" Bonds.	325,000	.....	.....	.....	May, '78	90	90	.....
Metrop.	1,000,000	100	5	2 1/2	May, '78	60	67	.....
W'msb'g	1,000,000	50	8	1 1/2	July, '78	75	80	.....
" Certifs.	1,000,000	.....	7	3 1/2	July, '78	95	100	.....
Citizens'	1,200,000	20	.....	3	July, '78	75	80	.....
" Certifs.	320,000	1,000	.....	3 1/2	Apr., '78	98	102	.....
J. C., N. J.	750,000	20	10	7 1/2	July, '78	150	160	.....
Municipal, N. Y.	400,000	50	.....	.....	.....	97	102	.....
" Bonds.	750,000	.....	.....	.....	.....	.....	.....	.....

*Ex Dividend.

Copper Stocks.

Reported by WILSON W. FAY & CO., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveller Building, 31 State street.

BOSTON, Wednesday Evening, Sept. 18, 1878.

The general appearance of the market has improved somewhat, a better feeling is manifested all around, prices are higher, the transactions are greater than they were

last week, and notwithstanding the lull there has been in these stocks for the past few months, a better market for the winter season may be hoped for, and should the price of copper rise (although as yet there is not much probability of it) we should have a market active enough to satisfy the most fastidious.

Calumet and Hecla is firm, and has sold up to 180, there being quite a number of transactions at that figure, and closing 179 1/2 bid, and 180 1/4 asked.

Copper Falls remains steady at 1 1/2 @ 1 1/4, and sales at 1 1/4.

Franklin is firm, though rather quiet, at 6 1/4 @ 6 3/4.

National had a little demand to-day at 20c. ass. paid, but no sales were made.

Osceola is quite strong at 10 bid and 11 1/2 asked and little stock offering.

Pewabic is quiet and inactive.

Quincy has been quoted at 13, but as near as we can ascertain no actual sales have taken place, as the stock is in demand at that figure, and none offering less than 14.

Ridge sold this afternoon at 1 1/4 and closes firm at 1 1/4 @ 1 1/8.

Duncan sold down to 3 1/2 and up to 3 3/4 and 4 and closes apparently firm at 3 3/4 @ 4, but beneath the apparent firm exterior there is a weakness that develops itself on every trivial occasion, and from appearances we should judge that there are a great many waiting as patiently as possible, with rumors of an assessment flying about, the time when they can sell out without sustaining a heavy loss.

International, on the other hand, looks quite firm, and there have been large lots of the stock taken out of the market recently and laid away, and the stock closes 50 bid and 60 asked, all the stock offering at 50 being taken.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Sept. 20, 1878.

The business of the week under review has been more than double as large as several of its predecessors, but if the Eastern business in mining stocks was all done through the Mining Exchange, there would be a much better showing made, and the Exchange would immediately secure a position it can never hold so long as its dealings are mostly low-priced stocks, most of which have even a smaller value than their market quotations. Quotations are regularly received each day from San Francisco, the first arriving here at about half-past two o'clock. An additional call of California stocks only has been inaugurated; it takes place at half-past three o'clock. This effort to increase the business of the Exchange is a meritorious one, but so far it does not appear to have the confidence of the public nor even of a great many members of the Exchange. Arrangements will have to be made to have quotations come direct from unquestioned hands in San Francisco to the Secretary of the Exchange here.

The dealings in the San Francisco stocks at the Mining Exchange are well maintained, and have been as follows during the week: California, 140 shares at \$11 1/2 @ \$14 1/4; Consolidated Virginia, 740 at \$13 1/2 @ \$18 1/2; Independence, 200 at \$3 1/2; Raymond & Ely, 6 at \$15; Sierra Nevada, 100 at \$185; Tip-Top, 25 at \$1 1/4; Consolidated Imperial, 15 at \$1 1/2; Julia, 140 at \$6 1/2 @ \$7; Leviathan, 1200 at 95 @ 85c.; Hussey, 100 at \$1.15, and Kossuth, 350 at 60 @ 50c. Of the more important stocks in the regular list the sales have been: American, 50 at \$4 (7); Hukil, 350 at \$4 @ \$4.20; Moose, 1250 at \$2.90 @ \$3.15; New York and Colorado, 200 at \$1.95 @ \$3; Ontario, 418 at \$39 @ \$39 1/2; Plumas, 1050 at \$4.15 @ \$4.30; King's Mountain, 100 at \$1.65. In the strict fancies the dealings have been at follows: American Flag, 200 at 10c.; Bertha & Edith, 68,800 shares at 7 @ 4c.; Buckeye, 6100 at 50 @ 58c.; Dahlonega, 2300 at 16 @ 11c.; Gold Placer, 15,800 at 26 @ 19c.; Lacroise, 56,800 at 24 @ 29c. The stock of the Findley Gold Mining Company, of Georgia, was called on Monday, and the sales have since amounted to 4300 shares at 53 @ 48c.

A telegram, dated September 17th, from Mr. John C. F. Randolph, who was sent to examine the Penobscot mine, says: "Penobscot is a splendid property, well worth the money. Dividends should be speedy and large, if (mine) well worked." This mine promises to be a good specimen of what Eastern capital should have put before it.

From such information as we have been able to secure, after a careful examination, it will prove a very profitable investment to those who shall be lucky enough to secure stock at par, the price at which a small quantity is still offered.

Mr. R. M. Wilson, Deputy United States Surveyor for California, has just made a report on the Dardanelles and Oro placer property of Placer County, Cal., now being offered in this market. Mr. Wilson has been familiar with the property for years, and gives it the highest character for material advantages and possibilities of production, and for a good record thus far. The placer mines of this (Placer) county yielded upward of \$1,200,000 gold during the past season, one of the most unfavorable seasons known for hydraulic mining. We learn that the time granted by

the owners of the Dardanelles and Oro to the Eastern parties in which to form a syndicate of purchase is about out, and that California parties are ready to take the property, in case not taken here within the allotted time. As we have intimated previously, Eastern investors desiring mines where the returns, while not enormous, are large, regular, and certain, will do well to examine into the proposition of the Dardanelles people, before it is withdrawn.

The committee of securities will look into the late action of the American Mining Co. in declaring a dividend, and afterward not paying it. Some stock of this company is said to have been offered at \$1 a share during the period between the announcement and the default, indicating that somebody knew the true condition of the company, and that it could not have been a miscalculation on the part of the superintendent.

There have been lively times among the stockholders of Gold Placer. We are only surprised that it did not occur before. Can not somebody be made to pay for the bleeding the public has received?

SAN FRANCISCO MINING STOCK QUOTATIONS.
Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS						Open- ing Sept. 20.*
	Sept. 13.	Sept. 14.	Sept. 16.	Sept. 17.	Sept. 18.	Sept. 19.	
Alpha	16	14 1/2	15	14 1/4	14 1/2	14 1/4	15
Belcher	12 1/2	9 1/2	10 1/2	9 1/4	11	9 1/2	9 1/2
Best & Bel.	30 1/2	30 1/2	32	30 1/2	32 1/2	31 1/2	32
Bullion	13 1/2	12 1/2	12	12	12 1/2	12 1/2	13
Caledonia	4	4	4	3 3/4	4	4	4
California	11 1/4	11 1/4	13 1/4	13 1/2	13 1/2	13 1/2	14
Chollar-Pot	48	53	44	45	45	44 1/2	46 1/2
Con. Imp.	.....	.....	.....	.....	.....	.....	.....
Con. Va.	13	13	15 1/2	14 1/2	14 1/2	15 1/2	15 1/2
Confidence	9 1/2	9 1/4	8 1/2	8 1/2	8 1/2	10	.....
Crown Pint	5	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9
Eureka Con	41 1/2	41	40 1/2	43 1/2	40 1/2	41	40
Exchequer	6 1/4	5 1/4	5 1/2	5 1/2	5 1/2	5 1/2	.....
Gould & Cur	21	18	18 1/4	17 1/2	18 1/2	18 1/2	18 1/4
Grand Prize	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	6
Hale & Nor.	16 1/2	14 1/2	14 1/2	15 1/2	15 1/2	16 1/2	11
Julia	6 1/2	6	6 1/4	5 1/4	6 1/2	7	7
Justice	11	10 1/2	10 1/2	9 1/2	9 1/2	10	9
Kentuck	9	8 1/2	7	7 1/4	7	7 1/2	.....
Mexican	59 1/2	55 1/2	58 1/2	55	59 1/2	60 1/2	62 1/2
North Belle	9 1/2	9 1/2	11	10 1/4	11	10 1/4	11
Ophir	51 1/2	50 1/4	54	52	60 1/4	62	62-64
Overman	18 1/2	17 1/2	17	15 1/2	17 1/2	17	17 1/2
Ray & Ely	5	5	5 1/4	5 1/4	5 1/4	6	6
Silver Hill	3 1/2	3 1/4	3 1/4	.....	2 1/2	3	.....
Savage	20 1/2	18 1/2	17 1/2	17	17 1/2	19 1/2	19 1/2
Seg. Belcher	45	.....	42	37	36	35	.....
Sierra Nev.	180	162	168	164	166	175	.....
Union Con.	110	103	109	103	111	124	.....
Yel. Jacket.	24 1/4	25	24 1/2	22 1/2	23	24	23 1/2

* Before call 10.30 A. M. † 180 @ 190. ‡ 126 @ 130.

With but few exceptions, the above list continues to advance. In the new bonanzas, Sierra Nevada and Union Consolidated, the advances have been nearly gradual throughout the operations of the week. There has been, at least to the knowledge of the public, no developments which would prove the non-existence of a genuine bonanza in the lower 2200-foot level of the Sierra Nevada mine, extending into the Union Consolidated. Nor have the operators in these stocks sufficient positive knowledge, and especially those who have only hearsay evidence, to warrant buying into these properties at the rate of \$19,000,000 and \$13,000,000, respectively. It will require a pretty big bonanza to return these sums as profits, or dividends. Next to these stocks the prominent features in the list are the continued advances in Mexican and Ophir, the former opening to-day at \$62 1/2 per share against \$60 a week ago, and the latter at \$64, against \$52 last week. Whether these advances are caused by the effect of the general buoyancy of the market or by a possible growing belief of the existence of plenty of bonanzas in the lower levels we cannot say; at all events, no evidence is given publicly of any recent favorable discovery in either of these mines. Alta is coming to the front, yesterday's closing quotation of \$17 showing a gradual advance of nearly 100 per cent for the week. The old bonanzas continue to slowly improve, both stocks showing a gradual appreciation during the business of the week.

The output of these mines now average about 200 tons per day each. The combined monthly products, of the two mines scarcely reach \$500,000. It is rumored that one or both of them may be in position in a month or so to resume \$1 dividends. This belief, and the approaching completion of the repairs to the shafts, etc., furnishes reasonable ground for the strengthening in the prices of these stocks. In Julia we note an improvement, the stock opening at \$7 to-day against \$6 last week.

Eureka Consolidated declared its regular monthly

dividend of \$3 per share on the 17th inst. This stock has regularly sold at about \$40 throughout the operations of the week, closing at \$41 last night and opening to-day at \$40, ex-dividend.

Recent information from the mine shows no important change, good progress being made in all parts of the same.

Grand Prize opens to-day at \$6, the highest price of the week. A recent published letter from this mine speaks very encouragingly of the prospects, etc., and the cutting of a new ore vein, which runs one-fourth gold. The stock of the Bodie Co. has suffered quite a decline. It is given out, in explanation of this, that the stock has been purposely manipulated that the large holders, who had formed a ring, might buy it in cheap. If this explanation is true, the public should let the stock alone at any price; and if caused by a fault of the mine, the stock was selling at too high a figure. The Commercial Herald of the 12th inst. says of the market:

"The mining share market has been carried to a wild and high pitch the past week, and the transactions have been extraordinarily heavy in the Boards, on the streets, and everywhere, giving a free foot to a larger number of companies than ever before known in the history of stock dealing on this coast. The north end mines on the Comstock have been jumping up, and up at an astonishing rate, Sierra Nevada keeping the lead, as will be seen by the annexed list of sales. It is now confidently asserted that the bonanza in the Sierra Nevada proves to be more than was at first expected, and that we may see the price of shares run up to surprising figures. Great caution should be exercised by outside investors during these exciting times, for so many mines of a worthless character are floated on the market, in all of which, of course, bonanzas are sure to exist, that the loss is far greater and more hurtful in this class of shares than in those that have real merit. The transactions in the regular sessions of the San Francisco Board have gained half a million over the previous week, having reached nearly \$6,500,000."

The Manhattan Silver Mining Co., of Nevada, has produced bullion during the present year as under:

Table with 2 columns: Month and Amount. Rows include January (\$67,300), February (72,000), March (120,500), April (143,900), May (112,400), and Total (\$803,700).

The Bulletin, in commenting upon the singular fact that this company makes no dividend returns to its stockholders, in face of its continued large output, says: "During the month of August the mill at the Manhattan mine reduced 479 tons ore, valued at \$103,837. In connection with the above, a correspondent wants to know why the mine is not paying dividends. He says it has been producing \$100,000 per month for the past four months, from an average of about 500 tons ore per month. The Manhattan mine commenced the payment of \$1 per share dividends in May, 1875. After paying two, it stopped until September, 1876, when it paid six more of the same amount, and then stopped. No dividend has been paid since February, 1877. A mine that has paid \$400,000 in dividends, and that is now producing as largely as during the dividend-paying period, ought to be able to give a satisfactory ex-

planation of what becomes of the bullion turned out from month to month.

Assessments, with dates when delinquent: Overman, \$3, October 10th; Chollar, \$5, October 8th; Julia, \$1, October 11th; Savage, \$1, October 8th; Argenta, 25c, October 11th; Eagle, 15c, October 15th; East Grand Prize, 5c, October 12th; Watt Blue Gravel, 10c, October 11th; Golden Terra (Black Hills), 50c, October 14th; Nevada Gravel, 5c, October 11th; Selby Hill, 10c; San Francisco Sulphur Mining Co., 10c.

The Standard Mining Co. has declared its regular monthly dividend of \$1 per share. The Leeds Mining Co. has declared a dividend of 10c. per share.

NOW READY.

"Gold and Silver Mines of America,"

BY R. C. STONE.

AN OCTAVO PAMPHLET OF 40 PAGES, presenting the salient points of Precious Metal Mining as an industry, so grouped as to give a comprehensive and intelligent view of the subject. The statistics given are of value to every one interested in the industry, while the concise and clear description of methods and terms will readily initiate the stranger into its mysteries. This brochure is well calculated to serve its main purpose—that of securing a better appreciation in the East of Gold and Silver Mining. The whole subject-matter, including statistics, is gleaned from the most authentic sources. It is just such a work as is needed to popularize mining investments. Price 20 cts.

Scientific Publishing Co.,

27 PARK PLACE,

P. O. Box 4404. NEW YORK.

"HARD PAN" INVESTMENT.

A syndicate is being formed to purchase and incorporate a very valuable mining property now in position to pay large dividends. The fullest information as to value, title, etc., is given on the most reliable authority. Everything is BONA FIDE AND HONEST, and there are large fortunes for those forming the syndicate.

Persons applying should have not less than \$10,000 available. Address GOLD, care of ENGINEERING AND MINING JOURNAL, P. O. Box 4404, New York.

157th Auction Sale.

50,000 TONS SCRANTON COAL,

On Wednesday, Sept. 25th, 1878.

THE DELAWARE, LACKAWANNA, AND WESTERN RAILROAD COMPANY will sell, by Messrs. JOHN H. DRAPER & CO., Auctioneers, at the Company's Sales-room, 26 Exchange Place, corner of William Street, New York, on Wednesday, Sept. 25th, at 12 o'clock, noon,

50,000 TONS OF COAL,

from the Lackawanna Regions, of the usual sizes, deliverable at Hoboken during the month of October, 1878.

The sale will be positive; each lot put up will be sold to the highest bidder. No bids in any form whatever being made for account of, or on behalf of, the Company.

The conditions will be fully made known at the time of sale.

TERMS—FIFTY CENTS PER TON payable in current funds on the day of sale, and the balance within ten days thereafter at the office of the Company.

SAMUEL SLOAN, President.

GRANVILLE GOLD COMPANY.

Incorporated November 10th, 1876.

Capital, \$1,000,000. 100,000 Shares, par value \$10. For the purpose of erecting additional machinery, a limited number of shares are now offered for sale. Send for prospectus to the Company's Office, 23 Dey street, New York, Room 1, where subscription books are now open. EDWIN H. MULFORD, Sec.

ARIZONA MINING BUREAU,

Office, 22 Astor House.

NEW YORK.

H. G. BIXBY, Mining Engineer.

W. H. ASHTON. P. DOYLE.

ASHTON & DOYLE, Dealers in Gold and Silver Mines and Valuable MINERAL PROPERTIES,

solicit correspondence for sale or purchase. 161 Broadway, New York.

N. S. KEITH,

Electro-Metallurgist.

A NEW PROCESS FOR DESILVERING LEAD.

See issue of JOURNAL July 13th, 1878. 41 Liberty Street, New York City.

ADVERTISERS' INDEX.

Air Compressors:

Table listing Clayton, James, Brooklyn, N. Y.; Griffith & Wedge, Zanesville, Ohio; Rand & Waring, New York.

Assaying Tools and Chemicals:

Table listing Benjamin, E. B., New York; Kreischer, B. & Sons, New York.

Attorneys and Counselors:

Table listing Britton & Gray, Washington, D. C.; Drinker, Henry S., Philadelphia, Pa.; Morrison & White, Georgetown, Col.

Bankers and Brokers:

Table listing Van Deventer & Patton, New York.

Belting and Rubbert:

Table listing Gutta Percha & Rubber Mfg. Co., N. Y.; N. Y. Belting & Packing Co., New York.

Blasting Powder:

Table listing Laffin & Rand Powder Co., New York; Miners' Supply Co., St. Clair, Pa.; Oliver, Paul A., Wilkes-Barre, Pa.

Boilers:

Table listing Abendroth & Root Mfg. Co., New York; Babcock & Wilcox, N. Y.; St. Louis Boiler Yard.

Boiler Tubes:

Table listing Eagle Tube Co.

Books and Periodicals:

Table listing Accidents in Mines; American Journal of Science and Art; Capital and Labor, London, Eng.; Coal Trade Review of the U. S.; Colliery Guardian, London, Eng.; Engineering, London, Eng.; La Houille, Paris, France; Miners' Journal, Pottsville, Pa.; Magnetic Variation in America; Publications; Polytechnic Review; Spon, E. & F. N., New York; Teknik Tidkrift, Stockholm, Sweden; The Brick, Pottery and Glass Journal.

Cement:

Table listing White, J. B. & Bros.

Clocks:

Table listing Seth Thomas, Thomaston, Conn.

Coal:

Table listing Berwind, White & Co., New York; Borda, Eugene (Koh-noor Coal), Phila.; Borden & Lovell, New York; Brown, S. H., & Co., New York; Consolidation Coal Co., Baltimore, Md.; Cox & Boyce, New York; Helmsbittel & Wells, New York; Hoboken Coal Co., New York; Kanawha Coal Lands for Sale; Kittanning Coal Co., Philadelphia, Pa.; Lehigh Valley Coal Co., New York; Maryland Coal Co., New York; New Central Coal Co., New York; Philadelphia & Reading Coal & Iron Co.; Shaw Brothers, Baltimore, Md.; Swords, A. S., New York; Wilson, G. R. & Co., Buffalo, N. Y.; Whitnev, McCreary & Kemmerer, N. Y.

Coal and Ore Separators:

Table listing Bradford H., Philadelphia; Fraser, Chalmers & Co., Chicago, Ill.

Dealers in Mining Properties:

Table listing Ashton & Doyle, New York.

Educational:

Table listing Colorado State School of Mines; Boston University School of Medicine.

Engineers and Chemists:

Table listing Bradt, W. H., Leadville, Colo.; Bates, Henry D.; Castner, H. Y., New York; Courty, Wm. C., Wyandotte, Mich.; Hill, John W., Hamilton, Ont.; Johnson, Albert, Georgetown, Col.; Keyes, W. S., San Francisco, Cal.; Marsb, Geo. E., Georgetown, Col.; Randolph, John C., New York; Reichenacker, Albert, Fairplay, Col.; Rothwell, Richard P., New York; Rolker, Chas. M., Reno, Nevada; Vinton, Gen. Francis L., Denver, Col.; Wilson Bros. & Co., Philadelphia; Wulsten, Carl, Rosita, Col.

Emery Wheels:

Table listing New York Belting and Packing Co.

Engineers' Instruments:

Table listing Heller & Brightly, Philadelphia; Keuffel & Esser, New York.

Engraving:

Table listing Photo-Engraving Co., New York.

Fire Brick:

Table listing Kreischer, B. & Sons, N. Y.; Maurer, Henry, New York.

Gas Process:

Table listing American Gas, Fuel and Light Co., Phila.

Hoisting Machinery:

Table listing Crane Bros. Mfg. Co., Chicago, Ill.; Copeland & Bacon, New York; Griffith & Wedge, Zanesville, O.

Hotels:

Table listing International Hotel; Teller House, Central City, Col.

Hydraulic Jacks and Punches:

Table listing Dudgeon, Richard, New York; Lyon, E., & Co., New York.

Machinists' Tools & Machinery:

Table listing The Pratt & Whitney Co.

Metal Brokers:

Table listing White, Edward P., New York.

Mineral Wool:

Table listing Elbers, Alexander D., New York.

Mining Bureau:

Table listing Bixby, H. G.

Mining Companies:

Table listing Granville Gold Co., New York; Plumas, G. & S., Mining Co., N. Y.

Mining, Crushing, Stamping and Smelting Machinery:

Table listing Aitchison, R. & Co., Chicago, Ill.; Blake's Stone Breaker, New Haven; Copeland & Bacon, New York; Fraser, Chalmers & Co., Chicago, Ill.

Ore Bags:

Table listing Bemis Bros. & Co., St. Louis.

Paints:

Table listing Howard Fleming.

Painters:

Table listing Upham, H. H., & Co., N. Y.

Patents:

Table listing Stetson, Thomas D., New York.

Pumps:

Table listing Cameron, A. S., New York; Clayton, James, Brooklyn; Crane Brothers Manufac'g Co., Chicago; Guild & Garrison, N. Y.; Hardick, Chas. E., Brooklyn, N. Y.; Knowles Steam Pump New York; Worthington, H. B., New York; Wright, Wm.

Railway Train Brakes:

Table listing Prosser, Thos., & Co., New York.

Railroads and Transportation:

Table listing Aitchison, Topeka & Santa Fe R. R.; Colorado Central R.R.; Denver & Rio Grande R.R.; Missouri, Kansas & Texas R.R.; New York & Philadelphia New Line; Pennsylvania R.R.

Roofs, Girders, etc.:

Table listing Scaife, Wm. B., & Sons, Pittsburg, Pa.

Rock Drills:

Table listing Am. Diamond Rock Boring Co., N. Y.; Burleigh Rock Drill Co., New York; Ingersoll Rock Drill Co., New York; Penn. Diamond Drill Co., Pottsville, Pa.; Rand & Waring, New York.

Safes and Scales:

Table listing Marvin Safe & Scale Co., New York.

Smelting and Refining Works:

Table listing Robertson, J. R., N. Y.; Stetefeldt Furnace Co., San Francisco, Cal.

Steam Engines:

Table listing Todd, Joseph C.; Fraser, Chalmers & Co., Chicago; Wright, Wm.

Steel Tools:

Table listing Crescent Steel Works, Pittsburg, Pa.; Park, Bro., & Co., Pittsburg.

Tubes and Pipes:

Table listing Worthington, H. R., New York; Abendroth & Root Mfg. Co., New York.

Water Wheels:

Table listing Alcott's, Mount Holly, N. J.; Stillwell and Bierce Mfg Co., Dayton, O.; Leffel, James, & Co., Springfield, O.

Wire Rope:

Table listing Hazard Mfg. Co., Wilkes-Barre, Pa.; Mason, John W. & Co., New York; Roebling's, John A., Sons, Trenton, N. J.

Miscellaneous:

Table listing Capital Wanted; Dividend Notice, etc.; Partner Wanted; Situation Wanted by an experienced Engineer; For Sale.