

THE ENGINEERING AND MINING JOURNAL



Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. XLIX.

MAY 17.

No. 20.

RICHARD P. ROTHWELL, C.E., M.E., Editor.

BOSSITER W. RAYMOND, Ph.D., M.E. Special Contributor.

Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

London: 76 Finsbury Pavement, London, E. C., Mr. Thomas B. Provis, Civil and Mining Engineer, Manager.

Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.

Peru, S. A.: Mr. John Newton, No. 2 Calle Constitucion, Calla.

Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.; Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria; Messrs. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand.

SUBSCRIPTION PRICE, including postage:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, \$1 per annum; \$2.25 for six months; all other countries in the Postal Union, \$3.

Monthly Export Edition, all countries, \$2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING CO., Publishers,

SOPHIA BRAUNLICH, Sec'y & Treas. R. P. ROTHWELL, Pres. and Gen'l Mgr.

P.O. Box 1833.

27 Park Place, New York.

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The sensation of the Tariff debate was the great speech of Congressman BENJAMIN BUTTERWORTH, of Ohio. It was a strong arraignment of the policy which discredits the protective system.

We are informed that 2,000 tons of Anaconda matte have been sold this week in Liverpool for reshipment to this country, and at present prices it is possible that further transactions of this nature may take place, though the improvement in the English market during the last few days makes it less likely. It is proposed that, in Stock Exchange parlance, these 2,000 tons of matte be "made up" or exchanged for 2,000 tons belonging to European bankers and lying on this side already, so that both parties will have the matte where they want it, and each save the freight across the Atlantic. If this can be arranged it will almost certainly lead to further transactions in the same direction.

The consumption of copper, both in this country and in Europe, is increasing enormously and at a greater rate than production, so that the prospects for high prices for perhaps years to come are so excellent that they should lead to large investments in the opening up of new mines.

Among the more important new demands for copper is that for electrical low-tension currents, where of necessity the copper conductors are of immense size (such as we referred to last week), 80,000 tons being said to

be required for Berlin; and the use of copper sulphate for the destruction of the phylloxera.

The European demand for sulphate many months ago bought up the entire stock and production of this country, and has led to the increase of plant at some of our works, and no doubt will still further increase our capacity in that direction. How far this use, which permanently withdraws the metal from use, is likely to continue we cannot say, but if arsenic, or possibly some other substances, should prove equally or even more efficacious than copper sulphate, this use for copper would suddenly cease. It is a somewhat uncertain foundation on which to base a large investment, but while this use lasts it not only absorbs a large quantity of the metal, but takes it permanently out of the world's supply.

As will be seen from the letter of a correspondent on another page, it is reported that 8,000 tons of Anaconda matte have been recently sold for this purpose, and it was stated at the meeting of stockholders of one of the English companies that they had contracted to deliver 10,000 tons of their copper during the year in this form; so that, for the time being the demand is one of importance.

THE NEW YORK AND JERSEY CITY BRIDGE PROJECT.

The scheme for bridging the Hudson between New York and Jersey City has been favorably reported upon by the majority of the Senate Committee on Commerce at the capital. It is some consolation to reflect that there was a minority at all. The plan calls for an outlay of \$40,000,000—but no hint is given as to how much more will be required. There is no question, in an engineering sense, that the bridge, with its 2,200-foot clear span, could be built somehow. The span of the Brooklyn Bridge is 1,600 feet; that of the Forth Bridge two middle spans is 1,710 feet. In view, however, of the awkward experience had with the New York and Brooklyn Bridge, where the cost, in one way or another, was run up far beyond the estimates, the proposal of Mr. LINDENTHAL should be very carefully scrutinized before the passage of the bill in Congress. If the Senate Committee had consulted disinterested experts a very different conclusion would have been reached. Yet the advisory action of the Committee need cause little alarm. The bill will probably fail in the Senate, more probably in the House, and after the public discussion and adverse criticism of the engineering profession, it is almost certain that the investing public will veto it. The project for a tunnel has the support of the engineers, that for a bridge has the backing of the politicians. A 2,200-foot span would be something to boast about; but \$40,000,000, to take the estimated figure, would be a high price to pay for a monument to an engineer.

Even this great span, built at a height that will make a very inconvenient grade in getting on or off the bridge, will interfere somewhat with the shipping, and nothing whatever should be permitted to do this, for the prosperity of the city depends upon its shipping facilities. On the other hand, a tunnel or tunnels with equal capacity can be constructed in much less time and for a very small part of the cost of the bridge, and their cost can be determined absolutely. The tunnel can be reached with much lighter grades, can be worked without interference in any way from the weather, and it can in no way interfere with our shipping. The bridge presents only the single advantage over the tunnel of being a promenade with a fine view, while the tunnel presents many important advantages over the bridge, not the least of these being that, on account of its less cost, it could carry freight and passengers at a much lower price, and yield a better return on the capital invested.

THE WAY TO SECURE BIMETALLISM.

The avowed object of many of the silver advocates is the adoption of bimetallism, the currency of both gold and silver at the same time. Very few will say that they intend to drive gold out of our currency and to bring us down to the single silver basis. No one objects to the unlimited currency of gold and silver together, provided it can be accomplished and maintained. The ENGINEERING AND MINING JOURNAL, representing the best interests of the mining and other industries of the country, has always held that the first step in the permanent establishment of bimetallism is an international agreement upon a ratio between gold and silver at which the metals will be taken by the principal commercial nations.

A rich nation like ours may buy the entire world's product of silver or of any other metal for a certain number of years, and thus, by creating a corner in the metal, may for that time advance its price to any figure desired; but this is only a temporary expedient, which, without the co-operation of the other commercial nations, must ultimately result in heavy loss to our people. Congress is now proposing to establish this corner in silver, putting the maximum price at \$1.29 an ounce troy, or at the ratio of 16 of silver to 1 of gold. The effect of our corner will unquestionably be the withdrawal of gold from this country. The conviction that foreigners as well as most of our own people will have, that this country will soon be on a single silver basis, and that all of our bonds or securities which do not call specifically for gold will be paid in silver, will bring them in for exchange into gold while that can be had, and the foreign countries which have found their superabundant silver an embarrassment

will take this excellent opportunity to convert a large part of it into gold at the top of the market. We believe, therefore, that in a very brief period our gold will have disappeared, and when we require its use we will find that we will then be on the single silver basis like India, or Mexico, or some of the South American States, and that silver will not, in fact, be worth \$1.29 an ounce in gold, but will be worth whatever its market value may be in countries that have gold to give for it.

The case would be different were the chief commercial nations to unite in fixing a universal ratio at which the metals would be taken by all. And this would naturally lead to the adoption of a universal coinage. Assuming such an agreement, it would be difficult to imagine anything which would tend in a higher degree to promote commercial intercourse among countries than the adoption of such a common coinage as that proposed by Mr. Granier in his ingenious and simple suggestion printed on another page, and we are very pleased to bring this suggestion before the readers of the JOURNAL. The present seems a peculiarly appropriate time for doing this.

If the chief European countries should agree upon a ratio between the metals; there is no reason why gold and silver could not be kept afloat at that ratio until the increased production of one metal as compared with the other should require the adoption of a new ratio.

WINDMILLS.

In the extraordinary development of power appliances during recent years some of the simpler sources of energy seem to have been comparatively neglected. It is true that water power is being more and more appreciated now that the transmission of its energy to a distance by electricity has been so successfully accomplished; but as a rule inventors of power machines appear to have turned their attention away from the prime forces of nature to the perfecting of mechanical detail in limited lines. No matter what the form of the secondary motors and appliances, in by far the majority of cases the artificial heat engine (and almost exclusively the form using steam) is assumed as the original power machine; and the water power engine (overshot water wheel, turbine, impact wheel, etc.) occupies almost all of the remaining field. Yet the natural forces offer many alternatives, though one hears less nowadays than formerly of solar engines, wave and tidal machines, and the like.

It is questionable whether the windmill, one of the oldest power machines and one even still constantly in use, has ever been fully appreciated or that its capacities are now realized. Is there not left much room for it? Mills of small power are used extensively for certain limited purposes, as in raising water to small heights for irrigating, and helping out the artesian bores whose flow does not quite reach the surface; and they were formerly used in grist mills in some countries. In the San Joaquin valley of California, for example, they are now used in great numbers for irrigating, and these modern windmills have been developed to a high degree in various patterns, horizontal as well as vertical, and with many automatic regulating and safety devices. But there is a wider field for them. More powerful wheels or a gang of wheels of the usual size could be used for many other purposes, and to a considerable extent, as, for instance, in mining, wherever there are steady drafts. If the wind power is more irregular than in the regions where they are now most used, perhaps they could be adapted to supplement, without supplanting, steam. For driving dynamos, and through them the usual train of electric engines and appliances, at first glance windmills would appear to be too irregular and uncertain in their operation; but there are vast possibilities for the improvement of electrical storage, and particularly where the electricity is to be stored at fixed points, in which case the weight of the storage batteries would not be the incumbrance it is in locomotive engines, thus allowing the use of cheap material. It is not altogether visionary to imagine such a development in methods of electrical storage as to place wind power almost, though perhaps never entirely, on a par with water power as a source of electrical energy.

A windmill ought to be a useful machine for such light work as pumping out shallow mines where the flow of water is not large and no power besides that of men and animals is employed for the other requirements of the works. Very little has been done so far in this direction. There are wide regions, where fuel is scarce, no water power available and the winds tolerably constant, in which the plan might be practicable.

In the future no doubt more attention will be given to the winds, the waves and tides, solar heat, earth currents and all the natural forces adapted to furnish useful energy. The key to most of the problems is in the economical storage of power on the large scale, since these forces are intermittent or variable. Coal, petroleum, natural gas and the forests are inexhaustible quantities, and will be drawn upon until either new heat sources are discovered, or some now unforeseen revolution in mechanics is brought about. The common water is only available in certain localities, and its utilization causes inconveniences and often dangers when the natural streams are interfered with in thickly settled countries. But the winds cost nothing except the harnessing.

However interesting speculations as to the future may be, the practical question now is, whether more might not be made of the windmill for low powers, and under suitable conditions. The great perfection attained by American manufacturers of windmills renders the extension of the use of these motors more easy, for the cost of a horse power is reduced to a very small sum as an original investment, and an altogether insignificant amount for repairs and running expenses.

PROTECT PROTECTION.

In every period of the history of protection up to within about a year, it was claimed that adequate protection meant an equalization of the natural and inevitable differences in the cost of production in this and the chief rival commercial nations. It was never intended to be the means of imposing heavy taxes upon our industries and our people to provide enormous funds to be spent in various demoralizing manners and in enriching the few. The statesmen and patriots of all political parties agreed upon this, and it is only within a year or so that this doctrine has received such a development as to create alarm in every one who seeks the successful and healthy establishment of our industries. It may seem a small matter to the recipient of the extra benefits of the high tariff that the hundreds of millions of dollars collected through this means should be expended in such demoralizing manners as wholesale payment of large pensions to every one, deserving or undeserving, who was in the army during the war. Not a few of these men enlisted simply to get the large bounty then paid, and not at all from patriotic motives, and as a matter of fact they ran less risk, suffered less hardship, and deserved far less of their country than the pioneers and prospectors of the West who have, at the imminent risk of their lives, gathered the information which has created an empire, and have been the founders of many useful industries. The coal miners, the locomotive engineers, the house painters, the river drivers in the great lumber industry, the seamen, and many others in industrial pursuits who run greater risks, undergo greater hardships, and receive less pay than the average soldier during the war, are certainly at least as well deserving of the nation's gratitude as the average soldier, and much more deserving than the mercenaries for whom it is proposed that millions of dollars are to be levied annually on the industries of the country. What makes the hardship greater is the fact that these onerous taxes are to be paid more especially by our wage earners.

No one wishes to belittle patriotism, and every one honors the man who makes sacrifices and who risks his life in defense of principle and for the defense of his country, but the men who save the country are not those who expect thereafter to be provided for, whether able-bodied or not, and to live on the labor of their fellow citizens, but the patriots are rather men like Commander COSGROVE, who at the State encampment of the Grand Army at Ellensburg, Washington, recently, protested against this pension craze and said: "The Government never did nor never will owe us one farthing. When a man's country is in danger, he owes to it everything he has, even his life. When the war broke out, we owed our country the offer of our service, and when we enlisted and did our duty, we paid our country only what we owed it. For our services our country does not owe us a pension, and it is unpatriotic for us to ask it"—except, of course, where the soldier was wounded or disabled in the service.

The extravagant expenditures of our Government in pensions and other grabs are apparently prompted largely by the desire to purchase by this means votes for politicians, and the industries of the country are taxed and their development retarded because we are, through these taxes, prevented from competing in the markets of the world. Our workmen are forced to accept lower wages than they would otherwise earn, because their occupations are restricted to the production of what our own people can consume, while we let other countries whose less intelligent workers under their less favorable conditions would be unable to compete with us take the markets of the world.

The time has fully come for a reduction, not an increase, in the war tariff, and the interests of the country at large, and nearly every industry in it, call loudly for this reduction and for strict economy in the administration of the government. The special beneficiaries of the tariff tax of course object to the lessening of their profits, but the people, and especially the wage earners, have rights also, and they now need protection from the policy that taxes them for the benefit of the rich and that protects trusts which makes the poor poorer.

The danger to our industries lies in the fact that the present despotism of protection will create such a revulsion that the people will not only drive out of office the party responsible for it, but will abruptly go to the other extreme, and will suddenly take off all duty on manufactures, even on those that absolutely require some protection to enable them to take firm root and stand alone.

Those who advocate moderation and a gradual reduction in the protective tariff are the best friends of the protective system, and its worst enemies are those who abuse it and bring it into disrepute.

THE "KNOWN LODE" AGAIN.

Decision of the U. S. Supreme Court in the Iron Silver Mining Company vs. Sierra Nevada Case.

By Our Special Contributor.

A decision delivered in the U. S. Supreme Court on the 28th of April, in the case of the Iron Silver Mining Company, plaintiff in error against Peter Campbell and others—which we may call the Sierra Nevada case, after the name of the lode-claim owned by the defendants—brings up in a new form the question. What is the force of the words "known to exist" in Section 2333 of the Revised Statutes? The words of the law are: "And where a vein or lode, such as is described in section 2320, is known to exist within the boundaries of a placer claim, an application for a patent for such placer claim, which does not include an application for the vein or lode-claim, shall be construed as a conclusive declaration that the claimant of the placer-claim has no right of possession of the vein or lode-claim; but where the existence of a vein or lode in a placer claim is not known, a patent for the placer-claim shall convey all the valuable mineral and other deposits within the boundaries thereof."

The leading decisions upon this subject were reviewed in my paper on "Lode-Locations" (*Transactions American Institute of Mining Engineers*, VI., 272; *ENGINEERING AND MINING JOURNAL* of November 1st, 1879), and I will here give only such brief outline as may serve to recall the status of the question.

In 1883 Judge McCrary, in the Sullivan case, held that the phrase, "known to exist," applies only to lodes duly located or recorded and owned by third parties before the application of the placer-claimant. His decision was reversed by the U. S. Supreme Court; but this part of it was merely declared to be irrelevant, because "not necessarily involved in the adjudication of the case at bar."

In the Reynolds case, the U. S. Supreme Court, overruling the Court below, held that if a lode be "known to exist" within the meaning of Section 2333 (whatever that may be) and if the parties claiming it as against the patentee of the placer-location which covers it have never located or recorded it, then the lode in question, being *ipso facto* reserved from the grant of the placer, belongs to the United States; and, although the lode-claimants have never acquired any title, yet the title of the placer-patentee is not sufficient to give him a standing as plaintiff in trespass or ejectment. In this case, it was assumed that the lode in question had been legally "known to exist;" and the Court took pains to avoid construing that phrase. Its language is (116 U. S. Reports, p. 696).

"It may not be easy to define the words 'known to exist' in this act. Whether this knowledge must be traced to the applicant for the patent, or whether it is sufficient that it was generally known, and what kind of evidence is necessary to prove this knowledge, we need not here inquire."

Chief Justice Waite delivered a dissenting opinion, in which he argued that even though in this case the lode were "known to exist," it was not an existing lode, but a lode-claim that was contemplated by the statute as constructively disclaimed; and that, since there was no lode-claim in existence in this case at the time of the placer patent-application, nothing had been disclaimed, and the statutory provision was not operative. He added, however, that if the parties accused of trespass, instead of intruding upon the ground in controversy without any title, had been trying to locate a lode-claim within the placer-claim upon a lode "known to exist" when the placer patent was applied for, "quite different questions would arise."

Such "different questions" did in fact arise when, at a later period, Messrs. Reynolds and Morrissey, in whose favor the majority of the court had ruled in the above case, proceeded to try to obtain a patent upon the lode in controversy, which was within the boundaries of a placer claim already patented. But the Surveyor-General fell back upon Judge McCrary's decision (which had neither been approved nor revised by the Supreme Court), and held, in accordance therewith, that the lode "known to exist" in the sense of section 2,333 must be one which has been located. As this was not the case in the proceeding before him, he refused to approve the survey.

Now, this new case presents the following interesting variation. Like all the foregoing, it is a case in which the Iron Silver Mining Company, as owner of a certain placer-patent, is in conflict with claimants of alleged lodes within boundaries given in the patent. But there is this great difference, that Campbell and others here appear as the owners of a patent for the Sierra Nevada lode claim. The Mayer patent, applied for November 13th, 1878, and granted January 30th, 1880, grants 56 acres of placer-ground. The Sierra Nevada patent is dated March 15, 1883, and covers ground included in the senior patent.

The owner of this later lode patent brought suit to recover possession of the Sierra Nevada claim. The case was heard by Judge Hallett without a jury, and decided by him in favor of the plaintiffs, on the ground that the Court "conclusively presumed and found, from the face of said Sierra Nevada lode patent, that the said Sierra Nevada lode claim had been duly discovered, located and recorded, and owned by the said patentees in said Sierra Nevada lode patent and their predecessors in interest (the said plaintiffs), within the exterior boundaries of the said tract of land described in said William Moyer placer patent, and the mining ground described in the said complaint and conveyed by the said lode patent is excepted out of the grant of the land described in and conveyed by the said placer patent."

Now there was nothing said about such a reservation in either patent; there was no hint in either document of a conflict or an investigation had before the issue of the junior patent. The whole of Judge Hallett's conclusion rests upon the assumption that the Land Office must have granted the later patent after due challenge to adverse claimants, and that it must have been satisfied, either upon investigation or by reason of the failure of adverse claimants to make the protest required by law, that the lode claim was a valid one. The presumption that the officers of the government did their duty in the matter rendered the lode patent itself, in the opinion of Judge Hallett, conclusive proof the validity of the title of the patentees, and since only one state of facts could make such a claim valid, he held "the face of said Sierra Nevada lode patent" to be conclusive proof of that state of facts.

This assumption the majority of the court (Justice Brewer and the Chief Justice dissenting) sharply rebukes, on the following principal grounds:

1. Proceedings in the land department for securing title to government lands are usually *ex parte*.

2. The provisions of the mining law requiring adverse claimants to appear within a certain period after the public notice of an application for patent, and declaring that if, at that period, no adverse claim shall have been filed, "it shall be assumed that the applicant is entitled to a patent," and that "thereafter no objection from third parties to the issuance of a patent shall be heard," etc., are "not intended to affect a party who, before the publication first required, had himself gone through all the regular proceedings required to obtain a patent for mineral land from the United States, had established his right to the land claimed by him, and received his patent, and was reposing quietly upon its efficiency and validity."

After an acute and convincing analysis of the statute, completely establishing this view, the Court observes:

"And this is just and is sound policy. Why should a party who has the legal title from the government of the United States, on which he relies with safety, be called upon to answer every adventurer who digs a hole in the ground thus conveyed to him and asserts a right to mineral found in that ground?"

3. If, then, a party already owning a patent is not bound to file an adverse claim every time a patent conflicting with his own may be applied for by some other party, it follows that his failure to file such adverse claim cannot bar him from a subsequent assertion of his rights; nor can the issue of a junior patent be held to be conclusive proof, *per se*, that the rights of the senior patent have been duly considered and adjudicated. In other words, the junior patent affords in itself no proof that the proceeding by which it was obtained was wholly *ex parte*.

4. The court declares that if before issue of the junior patent the Land Office did make investigation as to the validity of its claim against the senior patent, the record of such investigation should have been part of the record of this case, and cannot be presumed "from the face" of the junior patent. Moreover, the result of the investigation must be "always ultimately a question of judicial cognizance." This opinion is emphasized by calling attention to the difficulty of determining two "essential" facts before granting a lode-patent to ground included in a prior placer-patent. These two facts, it says, the placer-patentee "has a right to have tried by a court of justice." They are, first, the existence of the vein within his placer claim, and secondly, "most important of all," the question, "whether; if such mine existed, it was known to the party who applied for the patent at the time application was made."

I have italicized these words, because they seem to settle incidentally the very question into which, in deciding the Reynolds case, the court said, "We need not here inquire." Clearly the court now holds that the lode "known to exist" under section 2333 must be so known by the placer-claimant at the time he applies for a patent. The knowledge must be brought home to him.

No doubt such notice to all men as is involved in the regular location and record of a lode-claim would be fairly held to establish a legal presumption of his knowledge. A man who has a lode-location is not bound to "adverse" a placer. If the placer claimant says nothing in his application about this lode-claim, which is matter of public record, his application operates under section 2,333 as a conclusive disclaimer on his part of any right of possession to that lode-claim.

But may section 2,333 apply to some other knowledge in the mind of the placer claimant, concerning a lode which he "knows" to exist, though it is not located or recorded? This is undoubtedly intimated by the language of the decision before me. But I am confident that when the character of such private knowledge shall be, in some future case, defined by the court, it will be made to include actual discovery of the lode as a necessary element. For, as I have elsewhere argued, section 2,333 directs the placer claimant, if there be a known lode in his claim, to make separate application for the lode-claim. This he cannot possibly do without having discovered the lode. No discovery, no claim, says the Land Office. It seems perfectly fair to deduce from this principle the correlative one: No discovery, no disclaimer.

It will be seen at once that all the rubbish about general belief that a lode exists somewhere within a certain area, which the local Court admitted in the Reynolds case as tending to show the guilty knowledge of the placer-claimant, is swept away by the view of the matter here taken, and distinctly foreshadowed, I think, by the latest utterance of the Supreme Court. True, the Court may decline to confine the meaning of the phrase "known to exist" to actually located and recorded lodes, as Judge McCrary did. It may include the private knowledge of the claimant. But there will be no injustice in that, provided the degree of knowledge ascribed to him is the degree which would have enabled him to comply with the statute. Nobody cares to protect the man who, having discovered a lode which he might proceed to locate and record, prefers to cover it with a larger placer-claim, in order to get ground at \$2.50 per acre, for which he would otherwise have to pay \$5. But, on the other hand, nobody wants to hold a placer-patent subject to the perpetual cloud of a "floating grant" to a lode-claim somewhere within it, though nobody at the time of the acquirement of the placer-patent could point out the lode.

I notice, in conclusion, that this particular decision of the Supreme Court favors the Iron-Silver Mining Company. A victory once in a while must seem very grateful to that deserving but unfortunate party litigant. Perhaps this is the turn of the tide.

R. W. R.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Copper Sulphate as Remedy for Phylloxera.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It is stated that a sale of 8,000 tons of "anaconda," or Montana matte, has recently been made for use in destroying the *phylloxera* pest of European vines. Kindly explain at your convenience the mode of preparation and application, the actual percentage of copper used, and the possible demand for this purpose. The sale mentioned indicates that this use, involving the virtual annihilation of the metal, may be an important factor in the world's copper market.

W. H. S.

New York, May 12 1890.

Plymouth Consolidated Mining Company Management.

EDITOR ENGINEERING AND MINING JOURNAL.

SIR: Referring to your article on Plymouth Consolidated Mining Company in your issue of May 10th, and your interview with officers of the company, I am not surprised that they refused to give out any information regarding the new developments at the mine. If the information was of a bad character you would have received it fully, but being of a different character, they give out no more than they can help for the present, as some one is buying the stock and bidding for it right along. There certainly is some important strike or an improvement at the mine, otherwise this stock could not be sold for \$8.75 per share.

The recent buyers know the mine and know what they are doing when they commenced buying around \$4, and, if my information is worth anything, then Plymouth will again pay dividends as formerly, and that before long.

Shortly after the recent fire at the mine it was common talk among mining men at Plymouth and Jackson, in Amador County, that a rich body of ore had been exposed just previous to the fire, and the output of the mine at the time would indicate that the mine was not "worked out," as hinted.

A great many incidents in connection with this Plymouth mine will go to show that the managers did not care particularly to run the mine for several years, and in the meantime let the small stockholders weary of their stock and sell out. One incident will suffice. When Messrs. Hayward & Hobart, the managers and nominal owners of Plymouth, went down to Mexico and got hold of the Sonora group of mines there, they intended to devote their attention to the Mexican mines and leave Plymouth to "rot out" the many stockholders; but as luck would have it, they, Hayward & Hobart, met with a "cave" at their Mexican mine, and then their English partners began to ask for some explanations regarding the capitalization of this Sonora mine, all of which you are aware of, no doubt.

Now, finding themselves driven out of Mexico, they return to the Plymouth mine, and resume work. There is nothing in the Plymouth mine to-day that was not there two years ago, and if they had remained there and worked the property for the benefit of all concerned, Plymouth would be paying dividends to-day.

My own information from an expert warrants me in saying what I have, and more if I were at liberty to do so.

If Hayward & Hobart are sick of this property, I have no doubt that I could secure them a purchaser of their stock and the control, at \$10 per share. I say to the small stockholders, who bought at from \$12 to \$18, hold on to your stock, and it will not be many months before the ENGINEERING AND MINING JOURNAL will notice the resumption of dividends.

Yours truly,

PLYMOUTH.

NEW YORK, May 15, 1890.

NEW PUBLICATIONS.

THE VENTILATION OF BUILDINGS. By ALFRED R. WOLFE, M. E. Published by the author, New York. Paper, 8vo, 32 pp. Price 25 cents.

This pamphlet contains the data for calculations in designing inlet and vent flues for buildings, and suggestions as to the relative efficacy of different means of ventilating, heating and cooling rooms. The conditions which the architect has to consider are, of course, different from those existing in mines; and as the literature of ventilation as applied in architecture is scant, Mr. Wolfe's brochure is timely.

THE ELEMENTS OF LABORATORY WORK: A COURSE OF NATURAL SCIENCE. By A. G. EARL, M. A., F. C. S. Published by Longmans, Green & Co., London and New York, 1890. Cloth, 12mo, 179 pp.; illustrated. Price, \$1.40.

While the course of experimental study outlined in this book is described by the author as elementary, it also touches upon some of the most knotty questions in physics. These, however, are led up to gradually by the enunciation of simple fundamental laws which are illustrated by experiments intended to be repeated and extended by the student himself, and verified mathematically. Each section represents a lesson, and the sections are arranged progressively. The method pursued should furnish suggestions for the preparation of class-room experiments and for independent work of the student in the physical laboratory, where the practice would serve as a groundwork for further study in either of the natural sciences.

DES INGENIEURS TASCHENBUCH. Fourteenth revised edition. Published by the Verein "Hütte," Berlin, 1889. Duodecimo, in 2 parts, 779 + 596 pp.; over 900 diagrams, 1 plate. Price, linen covers, 8.80 marks; leather, 10.60 marks.

This, a large collection of tables, formulæ and compact information, is designed as a general reference book for the use of civil and mechanical engineers. The amount of matter contained in the 1375 pages is very great and covers a wide range of topics, of which the following outline of some of the principal headings will give an idea: mathematics, mechanics, heat, strength of materials, building materials, machine materials, machines, motors, railroad construction, labor, masonry, roofs, bridges, buildings, iron metallurgy, mills, paper works, glass works, weights, measures and coins, naval architecture, electricity, physical and chemical tables, laws of patents, shipping, etc. The small diagrams, lettered to correspond with the text, are profuse in number and appear to have been well chosen. The publication committee of the "Hütte" has accomplished a great work, if the editing of this mass of matter has been as careful as a hasty glance leads us to believe.

PRACTICAL MINING: A FIELD MANUAL FOR MINING ENGINEERS, WITH HINTS TO INVESTORS IN MINING PROPERTIES. By JOHN G. MURPHY, E. M. Published by the D. Van Nostrand Company, New York, 1890. Morocco, 12mo, 106 pp. Price \$1.50.

The author's purpose in writing this book seems to have been to emphasize the commercial side of mining—that is, the question of profit and loss. The book itself is not one on engineering, but contains some useful suggestions as to the points to be determined in ascertaining the probable net returns from a mining property on the basis of a stated equipment. A simple method of making up balance sheets in making preliminary estimates is given, with examples. The author points out that the work of the examining expert involves a consideration of the business conditions of a mine reported on as well as the technical points. He also gives some

very sensible advice to investors or persons seeking investment in mines, urging the necessity of at least as much foresight and circumspection in mining as in commercial or manufacturing enterprises; and incidentally he puts in a good word for the profession.

What Mr. Murphy says is, in the main, sound and practical, but he does not go very deep into the subject. The class of mines to which the book chiefly relates comprises those of refractory silver and gold ores, concentrating, shipping and smelting ores. It would have been improved by a subdivision into properly arranged sections, and the addition of a table of contents and index. As it stands, it is more in the nature of running notes than a complete manual.

REVISED POCKET GEOLOGIST AND MINERALOGIST, OR SIXTEEN CHAPTERS ON COALS, OILS, ORES AND OTHER MINERALS, FOR PRACTICAL PEOPLE. By FREDERICK H. SMITH. Published by the author, Baltimore, 1890. Cloth, 12mo, 208 pp. + index. Price \$1.

This is a revision and combination of two former books published by the same author—the "Pocket Geologist" of 1877, and "Rocks, Minerals and Stocks" of 1882. In the present volume Mr. Smith has improved upon his earlier publications, and adds some new features and a little information on discoveries made since the former issues.

Mr. Smith has some decidedly original theories on general geology and chemistry, on the origin and on the mode of occurrence of ore deposits, etc., which the reader will hardly accept as scientific gospel. It is a remarkable feature of the book that the author, who is so cautious in laying down general propositions when treating of practical things, should break his own rule of keeping on the safe side and should allow himself so much rope when he enters the field of speculation, where the observers of widest range and the most thoughtful guides venture with diffidence.

But the book has decided merits within certain limits. It furnishes information which should be useful to amateur prospectors and persons desirous of exploring their own neighborhoods, or to make a rough-and-ready determination of mineral substances which might be of value. It is very well arranged for handy reference, and is written in a plain colloquial style, which avoids the use of technicalities, and which will, therefore, be intelligible to people who have no scientific training. For prospectors who have confined their attention to one sort or a few classes of minerals, the "Pocket Geologist" gives some suggestions which might result in the finding of unfamiliar ores.

BULLETIN No. 1, GEOLOGICAL SURVEY OF MISSOURI. Published by the Survey, Jefferson City, April, 1890. Paper, 8vo, 85 pp.

The act establishing the bureau of geology and mines in the State of Missouri was approved in May, 1889. In September the State Geologist, Mr. Arthur Winslow, and his assistants began operations, and this bulletin is the result of field work accomplished since last autumn. It is some 15 years since the cessation of the last geological survey of the State, since when important developments have been made in the area then studied, while the new survey will have ample room for effort in unsurveyed regions.

The present organization appears to be doing good work, and we are glad to see that it is directing its field investigations mainly on the side of economic geology. The mineral wealth of the State is very great. Besides the well known iron, lead, zinc and coal mines, there are important resources in building stone, clays, etc., to be utilized, as well as extensions of the older industries. If the survey continues in the practical course outlined in Mr. Winslow's administrative report, it should do much to aid that development.

The present bulletin, besides the general report of progress, contains a paper (with map) by Mr. Winslow on the coal beds of Lafayette county; notes on the building stones, clays and sands of Iron, St. Francois and Madison counties, by Mr. G. E. Ladd; a paper on the mineral waters of Saline county, with map and numerous analyses, by Mr. A. E. Woodward; and a preliminary catalogue of Missouri fossils, by Mr. G. Ham-bach. The distribution of bulletins of this character is the readiest means of placing information before the public. The next one will contain a preliminary account of the lead and zinc region.

The Metal Production of Russia.—A comparison has been made between the latest report of the Russian Mining Commission, edited by M. Koubeline, and that published in 1878 by M. Skalkovsky. The report does not give any figures later than the end of 1887, but the comparison supplies important data for measuring the progress of the Russian metal industry. So far as the precious metals are concerned, the product of gold has fallen during these ten years from 2,572 to 2,128 pounds, while that of silver has increased from 699 to 939 pounds, and that of platinum from 126 to 269 pounds. The figures are different for the precious metals chemically refined, namely, 1,898 pounds of gold and 1,043 pounds of silver in 1887. Those for platinum are unknown, the melting of that metal being mainly carried on abroad. Notwithstanding the affinity that exists between silver and lead, and the increase in the produce of silver, less lead was extracted in 1887 than was the case ten years before—60,428 pounds, instead of 85,281. The amount of gold extracted is less than it used to be. It appears that less and less auriferous soil is discovered in the region of Yakoutsks. On the other hand, the fact that more gold is found in the quartz mines than formerly (164 pounds, instead of 87) is of favorable augury for the future. It is not believed by Russian economists that there will be much progress in the gold industry until the great Siberian railway is finished, as this scheme takes away the laborers from all other work, and makes the price of machinery abnormally high. The only progress of the gold industry at the present moment is found in the province of the Amoor. Foreign competition has for a long time been injurious to the production of copper, but the raising of the customs tariff has made an alteration by which the Caucasus has benefited. In 10 years the smelting of copper has risen from 214,865 to 304,607 pounds. On the other hand, zinc has fallen from 283,398 to 221,250 pounds, in consequence of the decline of the home demand. Very little tin is obtained in Russia (629 pounds in 1887), and that only in Finland. Quicksilver, a rare metal, was not worked in Russia until 1886, but in 1887 3,911 pounds of it were obtained. During the 10 years the extraction of manganese rose from 11,790 in 1878 to 3,553,535 pounds in 1887. In 1886, however, the figure was 1,000,000 pounds higher; the sudden fall is due to the rivalry of Chill.

SCHEME FOR MONETARY UNIFICATION AND A UNIVERSAL BANK.

BY EMILE GRANIER, OF WYOMING.

The monetary confederation of 1865, comprising France, Belgium, Italy and Switzerland, binding each other to certain monetary regulations, proved successfully what can be done by assimilations, unifications, or complete union. Satisfied with that evidence, the French Government, availing itself of the Universal Exhibition of 1867, appealed to all the nations of the world to study the best means to arrive at a general understanding on the monetary question.

All governments responded in the most earnest manner to that disinterested call, and accredited their most eminent citizens as delegates to the International Commission of Weights, Measures, and Moneys of 1867.

After careful examinations and debates, the International Commission adopted for the basis of general assimilation, unification or union, as the nations may choose, the Union Globe. Such a serious decision as the choice of a common unit of value for the whole world was not adopted solely because the said unit was in conformity with any existing particular money, but mostly because it is the exact expression of the average value of all the silver units used ages by all civilized countries to express the common value of all venal things. Mr. Feer-Herzog, delegate from Switzerland, was the first to explain that fact, and I have tried to illustrate it below.

In publishing the accompanying table I have tried to show how easily the moneys of different countries, keeping their respective denominations, can with very little changes be assimilated and rendered equivalent so as to avoid fractions, causes of intricate calculations.

Then moneys, although under different names, will be so easily compared together that every one, without effort of mind, will be able in looking over the quotations of foreign markets to understand and compare at a glance the various prices, and, figuratively speaking, to read them by mind in moneys of his own country.

This simplification is considered insufficient by a few sincere but too anxious men who demand an immediate radical transformation of all the moneys of the world. I consider it, on the contrary, an immense result, if obtained—a result that may in future lead to the complete unification desired, but not possible at present, since the comparatively slight changes I propose are yet considered as impossibilities, only surmounted by the indefatigable perseverance and tact of the eminent leaders of unification in some countries.

In order to illustrate Mr. Feer-Herzog's assertion, I have taken the ancient silver units of the twelve nations embraced in this table and placed opposite to them their relative values in actual francs.

The total of these different sums, divided by 12, gives an average that produces within half a centime the Union Globe, viz :

1 coin of 1 ducaton of Holland is equal to.....	FRS.
1 coin of 1 crown of England is equal to.....	6.70
1 coin of 6 livres of France is equal to.....	6.30
1 average of various dalers of Sweden, Norway, and Denmark is equal to.....	5.80
1 average of the dollars of America and United States is equal to.....	5.58
1 average of Flemish crowns, patacons, of Belgium, is equal to.....	5.56
1 coin of 1 piastre of Spain and Portugal is equal to.....	5.40
1 average of the various seudi of Italy is equal to.....	5.25
1 average of the various risdale of Switzerland is equal to.....	4.91
1 coin of 1 rouble of Russia is equal to.....	4.23
1 average of the various thalers of Germany is equal to.....	3.99
1 average of the various florins of Austria is equal to.....	3.71
12	francs 59.93

59 fr. 93c. divided by 12 is equal to 4 fr. 99 $\frac{1}{2}$ c.

Four francs 99 $\frac{1}{2}$ centimes is already a sufficient approximation, but if we add to 59 francs 93 centimes the average of the various units, the same increase of 1 $\frac{1}{2}$ per cent. that was added to the old French livre to make it the actual metrical franc, we find 60 francs, 004 mill. which, divided

by 12, produces 5 francs and a fraction so infinitesimal that it perfectly legitimizes the choice of the five-franc piece as the common type of the monetary unification.

I am aware that the practical reason for stamping coins specially is the responsibility imposed thereby upon each nation to keep the standard of its coins up to the true denominated value; but why should not a Congress of Nations determine in their respective moneys the exact value of a kilogram of gold and of the same weight of silver, out of which so many francs, dollars, pounds, roubles, marks, florins, liras, pesetas, etc., will be coined, with one side bearing the representative figures proper to each country, and on the other side the corresponding denomination of franc, dollar, pound, etc. These coins being faithfully minted by each government will be received indiscriminately by the citizens of all the nations in the Union in payment of all public and private dues.

It appears almost like ancient history, and yet it is within the recollection of many of us, and, comparatively speaking, only a few years ago, that at the Jersey City ticket office of the Philadelphia Railroad note but New York money was received; at that time exchange was up to 25 per cent. between Chicago and New York. Any one proposing at that date uniformity of bank-note circulation throughout the United States was considered currency-mad. The simple organization of national banks based upon Federal bonds, instead of bonds of the special State in which the bank existed, had the effect of equalizing in a few weeks money transactions all over the country.

Is not the American Union more closely united and consolidated by this simple fact? From the present American system I have taken my idea of a universal bank, and I humbly claim to have contributed my quota to this American system in its infancy.

Among the objections raised against the unification of moneys, it is said that coins, being current in every country without need of being melted, be much more rapidly exported, hence, monetary crises may arise. I believe, on the contrary, that universal free circulation will induce people to attach less importance to the precious metals. Political crises will diminish by the very fact of a more compact union between governments and people, and war will thus be rendered so improbable that the credit of nations will be mutually considered safe, and creditors instead of exacting gold for the payment of the balance of trade, will settle them by account currents or by arbitration of exchange easily attainable by the public at large, who will at a glance understand the equation of dollars, francs, pounds, etc., without the long and intricate calculations needed even by the most expert exchange bankers, whose business will increase in proportion to international communications, in the same ratio as railroads have increased the use of ordinary conveyances, instead of suppressing them, as was feared by postmasters when railroads were first instituted.

I am fully aware that unification of moneys cannot prevent natural exchange due for balance of trade from one part of the world to another, especially if nations are to keep constantly turning in the absurd syllogistic circle of immense military organizations to protect national industry; and of unlimited industrial productions for paying gigantic armies; each and all accumulating tremendous overstocks, wearing out the best forces of the people, and forcibly productive of commercial and monetary crises, that periodically establish the balance by individual losses and unhealthy conditions of social organization. I believe that if instead of trying under the pretext of saving their independence by forcing, even against the intention of nature, the production of everything within their own territory, nations would strive to remove causes of estrangement, a true and compact union would be easily accomplished. Then each country would confine itself to the products best adapted to its natural conditions and geographical climate, and would gradually put in practice real intelligent free trade. Exchange between different localities would still exist, but at a reduced rate, for the unification of moneys can but bring as one of its results greatly increased commercial intercourse.

Silver and gold have been used for money because their production is

Session en France 1892 à 1896

BANQUE UNIVERSELLE

CONFÉDÉRATION DES BANQUES NATIONALES DE CHAQUE PAYS DE L'UNION MONÉTAIRE

Paris, le 1^{er} Janvier 1892

CAPITAL SOCIAL 1200 MILLIONS DE GLOBES

30 GLOBES

RAPPORT DE L'OR A L'ARGENT
15 1/2 UNIVERSEL
MONNAYAGE ILLIMITÉ
TITRE 900 FIN
Adoptés par le Congrès de Paris
A avril 1891 et irrévocablement ratifiés
par chaque nation, comme
BASES DE L'UNION MONÉTAIRE

30 GLOBES

Usant du droit que chacune possède séparément, les Nations réunies en Congrès ont fixé un rapport de poids et un litre uniformes pour les métaux de leurs monnaies et ont adopté une unité monétaire internationale.

VINGT GLOBES DE L'UNION

L'échange monétaire universel de 1 kilo Or pour 15 1/2 kilos Argent ou 15 1/2 kilos Argent pour 1 kilo Or équivaut à la fusion des deux métaux en une seule substance de valeur uniforme et invariable.

Payables à vue en Or ou en Argent au choix du Porteur par une des Banques de l'Union

LA BANQUE DE FRANCE	par	100 francs.
" " BELGIQUE	"	100 "
" " SUISSE	"	100 "
" " ITALIE	"	100 livres.
" " ESPAGNE	"	100 pesetas.
" " HOLLANDE	"	100 guilders.

GARANTIS

INTÉGRALEMENT PAR UN DÉPÔT RÉCIPROQUE D'OR ET D'ARGENT DE CHACUN DES PAYS DE L'UNION

LA BANQUE D'ANGLETERRE	par	4 Pounds sterling
" " ETATS-UNIS	"	20 dollars
" " RUSSIE	"	20 roubles.
" " ALLEMAGNE	"	80 marks.
" " SCANDINAVIE	"	80 kronas.
" " AUTRICHE	"	40 florins.

Le Contrôleur: R. Limberg

Le Garde du Sceau: Henri Darby

Le Gouverneur: Emile Grunert

Le Trésorier: C. David

Les Contrefacteurs seront poursuivis dans les pays de l'Union monétaire d'après la nouvelle loi internationale

NOTE.—The back of this plate is the face of the bank-note for America.

UNION GLOBE.

Weight 25 grammes of silver 900 fine (or 1 gramme 612c. 90m. of gold 900 fine.) Basis of monetary unification.

Monetary Confederation of 1865.	UNITED STATES.	ENGLAND.	SPAIN, PORTUGAL, SOUTH AMERICA.	AUSTRO-HUNGARY.
FRANCE, BELGIUM, ITALY, SWITZERLAND. The franc is divided into 100 centimes, 1,000 millimes, and multiplies or divides exactly the union globe.	The dollar (\$) is divided into 100 cents, 1,000 mills, and if reduced 3/4 per cent., as proposed to Congress by Samuel Hooper will represent exactly the union globe.	The pound (£) is divided into 20 shillings, 240 pence, 960 farthings, and if reduced 1 per cent., as proposed to Parliament, will correspond by its fractions exactly to the union globe.	The conditions of the Monetary Confederation of 1865 were accepted by a law passed in 1869 in the Spanish Cortes. The peseta is divided in 100 centimes, 1,000 mills, and divides or multiplies exactly the union globe.	Conditions of the Monetary Confederation of 1865 accepted by the provisional convention signed in 1867, and by which the florin will be increased to exactly the half of the union globe. The florin is divided in 25 gros, 100 kreutzers, 250 pfennigs divides and multiplies exactly the union globe.
GOLD COINS 900 FINE.	GOLD COINS 900 FINE.	GOLD COINS 900 FINE.	GOLD COINS 900 FINE.	GOLD COINS 900 FINE.
a. FEDERAL = 25 francs... (Weight 8 grammes 64.50.) b. 20 francs = 20 francs... *12 francs 50... b. 10 francs = 10 francs... b. 5 francs = 1 GLOBE = 5 francs.	b. HALF EAGLE = 5 dollars = 20 quarters. (Weight 8 grammes 64.50.) *1 dollars... *2 1/2 dollars = 10 quarters... b. 2 dollars = 2 dollars = 8 quarters. b. 1 dollar = 1 dollar = 1 GLOBE 4 quarters.	b. SOVEREIGN (Pound St.) = 20 shillings. (Weight 8 grammes 64.50.) *16 shillings... b. 1/2 pound = 10 shillings... a. 1 new coin = 8 shillings	b. DOBLON = 5 piastras = 25 pesetas (Weight 8 grammes 64.50.) b. 4 piastras = 4 piastras = 20 pesetas 12 pesetas 50 centimes... b. 2 piastras = 2 piastras = 10 pesetas	b. AUSTRIA = 10 florins = 25 marks (Weight 8 grammes 64.50.) b. 8 florins = 8 florins = 20 marks. 6 florins. b. 4 florins = 4 florins = 10 marks. b. 2 florins = 1 globe = 2 florins = 5 marks.
SILVER COINS 900 FINE.	SILVER COINS 900 FINE.	SILVER COINS 900 FINE.	SILVER COINS 900 FINE.	SILVER COINS 900 FINE.
b. 5 francs... *2 francs 50 centimes... b. 2 francs... *1 franc 25 centimes... b. 1 franc... *20 centimes... *60 centimes... b. 50 centimes... b. 25 centimes...	b. 1 dollar = 1 GLOBE... b. 1/2 dollar = 50 cents... b. 1/4 dollar = 25 cents... b. 1/20 cents... *12 cents... b. 1 dime = 10 cents... b. 1/2 dime = 5 cents...	*1 double florin = 4 shillings = 1 globe. b. 1 florin = 2 shillings... *20 pence... b. 1 shilling... *10 pence... b. 6 pence... *5 pence... *2 1/2 pence...	b. 1 piastra = 5 pesetas = 1 globe... 2 pesetas 50 centimes... b. 2 pesetas = 2 pesetas... 1 peseta 25 centimes... b. 1 peseta = 1 peseta = 100 centimes 60 centimes... 1/2 peseta = 50 centimes... 1/4 peseta = 24 centimes... 20 centimes...	b. 2 florins = 2 florins = 5 marks = 1 globe. b. 1 florin = 1 florin = 2 1/2 marks. 20 gros. b. 1/2 florin = 12 1/2 gros. b. 1 neu-mark = 10 gros = 10 pfennigs 6 1/4 gros. b. 1/2 neu-mark = 5 gros = 50 pfennigs. b. 1/4 neu mark = 2 1/2 gros = 25 pfennigs. b. 20 pfennigs.
COPPER COINS.	COPPER COINS.	COPPER COINS.	COPPER COINS.	COPPER COINS.
b. 10 centimes... b. 5 centimes... *25 millimes... b. 1 centime...	b. 2 cents... b. 1 cent... *5 mills... *2 mills...	b. 1 penny... b. 1/2 penny... b. 1/4 penny = 1 farthing... b. 1/8 farthing...	10 centimes... 5 centimes... 2 1/2 centimes... 1 centime...	4 kreutzers = 10 pfennigs. 2 kreutzers = 5 pfennigs. 1 kreutzer = 2 1/2 pfennigs. 1 pfennig.
The franc is exactly the fifth of the union globe.	\$ signifies dollar. The dollar is actually worth about 3/4 cents more than the union globe.	£ signifies pound sterling. The pound sterling is actually worth about 2 1/4 pence more than 5 union globes.	The peseta was worth 92 French centimes, and is increased by the law of 1869 to 100 centimes, being thus exactly one-fifth of the union globe.	

a. Proposed coins for facilitating unification. b. Column of existing coins. * Those words in italics indicate the corresponding value expressed by a single coin of another country, viz: 1 shilling = 1 franc 25 centimes. 1 franc = 10 pence.

limited by nature, notwithstanding all the efforts of men to increase it; and it is the aggregate sum of both metals accumulated since ages that serves to appreciate the value of all commodities of life and to make up the inventory of the wealth of the world at large. The yearly production of each metal in proportion to that accumulated aggregate is so small that it does not disturb prices. It is the suppression or the inflation by artificial means of either that creates disturbance in financial affairs. Both silver and gold must be used without reserve as produced by nature. Thence bank notes must merely be the representative of silver and gold deposits. Enlarging upon that axiom, I consider that for an interna-

tional bank the silver and gold deposits guaranteeing the bank notes in circulation must be secured by a pledge of the people of each country, through their government, giving as an additional security a first mortgage on the soil of their country.

Though convinced by the conscientious study of the subject, I hesitated a long time before publishing this project, but the numerous manifestations of high and friendly approval received have induced me to persevere, and come to the conclusion that the majority of the nations of the civilized world are ready for a Universal Bank, based upon true capital that can neither be burnt, lost, or stolen—I mean the results of the aggre-

UNITED STATES OF AMERICA
Washington July 4th 1892...

BY ACT OF CONGRESS THE PEOPLE OF THE UNITED STATES OF AMERICA BIND THEMSELVES TO PAY THROUGH APPROVED JULY 1891

BANK OF AMERICA
To Bearer on demand

TWENTY DOLLARS

in Gold or Silver 900 Fine
Representing 20 Union Globes

the Cashier the President the Director

20 DOLLARS

All counterfeiters will be prosecuted in every country of the monetary Union according new international law

UNION GLOBE.

Weight 25 grammes of silver 900 fine (or 1 gramme 612e. 90m. of gold 900 fine.) Basis of monetary unification.

GERMANY.	RUSSIA.	SWEDEN NORWAY, DENMARK.	HOLLAND.
<p>The mark, if increased 1¼ per cent., will represent exactly the quarter of a union globe.</p>	<p>The rouble, divided into five slaves, 100 kopecks 1,000 millimes if increased 27 per cent. would represent exactly the union globe.</p>	<p>Their average reduced 10½ per cent. to form a new globe that will equal exactly the union globe, and its fifth part is called already a franc, divided into 100 cents 1,000 mills.</p>	<p>The ½ guilder or ⅓ florin called new guilder divided in 100 centimes 1,000 millimes if reduced 4¾ per cent. will be exactly the fifth of the union globe.</p>
<p>GOLD COINS 900 FINE.</p> <p>a. GERMANIA = 20 marks..... (Weight 8 grammes 64.50.) *4 kronen..... *2 kronen 25 silbergroschen..... b. 2 kronen = kronen..... b. 1 krone = 1 globe = 4 marks.....</p> <p>SILVER COINS 900 FINE.</p> <p>b. 1 krone = 4 marks = 1 globe..... b. ½ krone = 25 silbergroschen..... b. *20 silbergroschen..... 1 mark = 10 silbergroschen = 100 pfen. b. *6 silbergroschen..... b. ½ mark = 5 silbergroschen = 50 pfen.. b. ¼ mark = 2½ silbergroschen = 25 pfen.</p> <p>COPPER COIN.</p> <p>b. 10 pfennigs..... b. 5 pfennigs..... b. 2½ pfennigs..... b. 1 pfennig.....</p>	<p>GOLD COINS 900 FINE.</p> <p>b. IMPERIAL = 5 roubles = 25 slaves... (Weight 8 grammes 64.50.) b. 4 roubles = 4 roubles = 10 slaves..... b. 2½ roubles..... b. 2 roubles = 2 roubles = 10 slaves..... b. 1 rouble = 1 GLOBE = 1 rouble = 5 slaves.</p> <p>SILVER COINS 900 FINE.</p> <p>b. 1 rouble = 1 globe..... b. ½ rouble = ½ rouble = 2½ slaves = 50 kopecks..... b. ¼ rouble = ¼ rouble = 25 kopecks..... b. 1 slave = 20 kopecks = 200 millimes... 12 kopecks..... b. Slave = 10 kopecks = 100 millimes. b. ¼ slave = 5 kopecks = 50 millimes... 4 kopecks = 40 millimes.....</p> <p>COPPER COINS.</p> <p>b. 2 kopecks..... b. 1 kopeck..... b. ½ kopeck..... b. one-fifth kopeck.....</p>	<p>GOLD COINS 900 FINE.</p> <p>a. GRAND DUCAT = 5 new ECUS = 25 francs (Weight 8 grammes 64.50.) b. Double carolin = 4 ECUS = 2 francs... 12 francs 50 centimes..... b. Carolin = GLOBES = 10 francs..... b. ½ carolin = 1 GLOBE = 5 francs.....</p> <p>SILVER COINS 900 FINE.</p> <p>b. 5 francs = 1 GLOBE = 5 francs..... 2 francs 50 cents..... b. 2 francs = 2 francs..... 1 franc 25 cents..... b. 1 franc = 1 franc = 100 centimes..... 60 cents..... b. 50 cents..... b. 25 cents..... b. 20 cents.....</p> <p>COPPER COINS.</p> <p>b. 10 cents..... b. 5 cents..... b. 2 cents..... b. 1 cent.....</p>	<p>GOLD COINS 900 FINE.</p> <p>a. DOUBLE DUCAT = 25 guilders. (Weight 8 grammes 64.50.) b. 20 guilders = 20 guilders. b. 12 guilders 50 centimes. b. 10 guilders = 10 guilders. b. 5 guilders = 1 globe = 5 guilders.</p> <p>SILVER COINS 900 FINE.</p> <p>b. 1 riksdaler = 5 guilders = 1 globe. 2 guilders 50 centimes. b. 2 guilders = 2 guilders. 1 guilder 25 centimes. b. 1 guilder = 1 guilder = 100 centimes. 60 centimes. b. ½ guilder = 50 centimes. b. ¼ guilder = 25 centimes. b. 20 centimes.</p> <p>COPPER COINS.</p> <p>b. 10 centimes. b. 5 centimes. b. 2½ centimes. b. 1 centime.</p>
<p>The mark is actually worth about one-quarter of a union globe or about 24½ cents of the United States.</p>	<p>The rouble is equal to four-fifths of the union globe less a small fraction that might be added in manufacturing new coins, thus making without change the rouble correspond exactly by its multiples or fractions to the union globe.</p>	<p>The average of the three dalers is worth about 8½ per cent. more than the union globe. There are already in circulation in Sweden gold carolins with the inscription of 10 francs.</p>	<p>The riksdaler is actually worth 4¼ per cent. more than the union globe.</p>

a. Proposed coins for facilitating unification. b. Column of existing coins. * Those words in italics indicate the corresponding value expressed by a single coin of another country, viz:—1 shilling = 1 franc 25 centimes. 1 franc = 10 pence.

gate labor of the people of each country represented by coins, and, in addition, also secured by first mortgage on the soil of their country.

The organization of the Universal Bank is simple, as it is merely the incorporation into an international syndicate of the national banks of each country mutually endorsing each other's bills so as to render them indiscriminately current; each local bank continuing independently its business proper according to the customs and usages of its respective people. Were it not for the irregular value of the existing bank notes causing certain difficulties, the bank could be started at once. It is therefore necessary to resort to the unification system, illustrated by the models herewith presented.

The Universal Bank, or supreme international syndicate composed of directors named or delegated, two or more, by the national bank of each country, will have for duty the printing of its bills, the control of their issue and proportionate allotment. Such a council requires only a limited personal and material administration, easily transferred alternately every four years to the capital of each country. Alternate change of residence is important for raising the independence of the bank above all possible local preponderancy, and also to afford to the directors a *de visà* practical knowledge of the wants of each part of the Union.

I have adopted for expressing the international money the term of UNION GLOBE (value 5 francs), justly accepted by the International Com-

BY ACT OF PARLIAMENT PASSED JUNE 17 1891.....

VICTORIA I. BRITANNIARUM REGINA

THE PEOPLE OF GREAT BRITAIN BIND THEMSELVES TO PAY THROUGH

The Bank of England

the Bearer on Demand No

the Sum of Twenty Pounds

in Gold or Silver 900 Fine Representing 20 Union Globes

London 1st January 1892.....

The Governor
James Forester

Gold or Oro

INTERNATIONAL POUND 25 FRANCS 3 DOLLARS 20 MARKS 10 SHILLINGS

Gold coins of England 900 fine

Silber Argent Plata

ONE CROWN 5 SHILLINGS. ONE GLOBE 4 SHILLINGS 5 FRANCS 5 PESETAS 5 LIRES 4 MARKS 2 FLORINS. 1 DOLLAR 1 ROUBLE.

Silver coins of England 900 fine

Cuivre Kupper Cobre

PENN 1/2 PENN 1/4 PART 1/8 PART

1 SHILLING 6 PENCE 3 PENCE 2 PENCE 1 PENNY

Four

All counterfeiters will be prosecuted in every country of the monetary Union according new international law

mission of Moneys of 1867 as offering the least ground for national prejudices; and mostly because the meter, intended basis of all future international weights, measures, and moneys, being the ten-millionth part of the quarter of the terrestrial meridian, can be everywhere accurately established and verified.

The models represent a 20 Union Globe Bill. On the face is printed by the Universal Bank its own vignette, always uniform in language and denomination. In the center is the guarantee escutcheon containing the names of each country of the Union in which the bill is current. On the sides is indicated the corresponding value of the Union Globes payable in gold at sight by any one of the local banks in special money of their country, viz.:

- 20 Union globes payable by the Bank of France by 100 francs.
- " " " " " America by 20 dollars.
- " " " " " England by 4 pounds.

and so on for the other countries. Bills so issued will be real coin certificates allotted equally to the local banks of the Monetary Union, who will constantly keep in their vaults the integral amount in their respective coins always ready for reimbursing their bills printed on the back of the bill of the Universal Bank by said local banks in the special language denominations and design proper to their country, but always of a value corresponding to the amount of Union Globes indicated on the face. For instance: the bill issued by France will bear the ordinary vignette and denomination in French of the Bank of France of 100 francs, corresponding to 20 Union Globes. The bills issued in the United States will bear the American vignette and denomination of 20 dollars of the Federal Bank of America, corresponding to 20 Union Globes. The bills issued by England will bear the ordinary model and denominations in English of the Bank of England of a value of four pounds sterling, corresponding to 20 Union Globes, and so on for the other countries. Each special vignette carrying also the pledge of the people and the fac-simile of the coins of the country receivable in payment of the bill. The last addition is not very important except to render the various coins of the world better known and more familiar, and to more clearly indicate their source of origin.

By this mutual indorsement each nation will continue to possess its ordinary bank note, with the additional advantage of the uniform stamp of the Universal Bank, rendering said local bill publicly current in all countries of the monetary union.

The bills being printed separately, the face by the Universal Bank, the back by the local bank, offer a double control and guarantee against illegal or over issue by any one of them, and also against counterfeiters.

The aggregate amount of the issue for each country, either equally or *pro rata* to its population, can be decided only by an international commission.

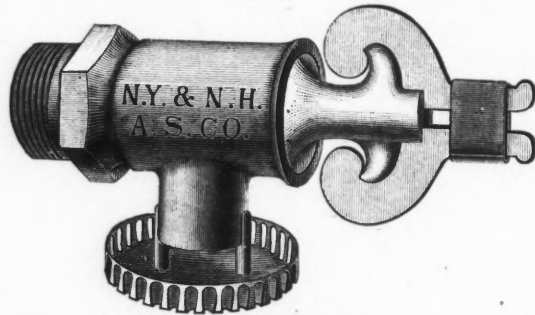
Electric Lighting in Japan.—During the past few years the application of electricity has made great progress in Japan, there being now five large companies carrying on the lighting of buildings, etc., from a central station. The stations at Tokio, Kioto, Kobe, Osaka and Nagoya are stated to have lighting power for 22,300 lamps, 11,000 of which are said to be in use. Besides these ten other companies have received permission to erect works at Nagano, Kumamoto, Nagasaki, Hakata, Yokohama, Hiroshima, Shudznoka, Hukodate, Niigata, with a total power of 16,800 lamps. The first company was established in Tokio in 1886.

The Natural Gas Supply.—There is an evident anxiety and uneasiness of feeling concerning the supply of natural gas in the Pittsburg region. The supply has become so uneven and unreliable in many quarters that manufacturers are seeking other fuel supplies. Oil gas plants have been placed in a number of iron and steel mills and are running now in conjunction with the natural gas, and are intended to take its place unless present indications fail. In Johnstown, Pa., within a short time Archer oil-gas plants have been substituted for natural gas in three mills. The natural gas supply appears amply sufficient for domestic or house purposes, but it is not inexhaustible, and its use for manufacturing purposes has already exceeded the capacity of the fields.

NEW AUTOMATIC SPRINKLER.

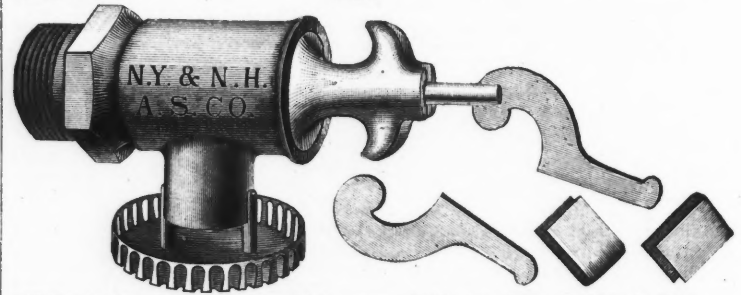
After several years spent in experimenting with a number of automatic systems of sprinklers for extinguishing fires the New York and New Haven Automatic Sprinkler Company claims to have perfected a contrivance which has none of the objections that have been urged against sprinklers generally, and which has some advantage over the old systems. Until now the main objection to sprinklers has been that they were so constructed that the fusible plug or disc, the melting of which released a shower of water, was placed in direct contact with the water in the pipes, and consequently a greater heat was required to melt it than the initial fusion point of the exposed metal would indicate.

SHUT.



Besides this, insurance men have urged that rust and corrosion have obstructed the action of jointed parts. In the sprinkler under consideration most of the changes have been made at the suggestion of fire underwriters, and, indeed, they have indorsed it as now improved. There are no jointed parts, and the action is simple. In the sprinkler marked "shut," the soft metal binder around the two arms keeps a metal plug and head in place. While this is so closed the water cannot enter the head of the sprinkler, nor is it at any time in contact with or near the fusible metal. The soft solder that binds the band fuses at 165 degrees, drops off, releases the arms, which also drop off, and the pressure of the water forces the released head and bolt out, and enters the sprinkler.

OPEN.



Hitherto the two arms which are held in place by the fusible binder were hinged to the head. The removal of the joints, and the entire disconnection when the heat has fused the binder, makes this chief factor in the action a highly sensitive one. With even the most trifling pressure of water the head and bolt must shoot out when the arms drop, and then the entrance to the pendant sprinkler is clear, and the water scatters like a fountain all about the immediate locality of the fire or heat.

Session en France 1892 à 1896

Paris, le 1^{er} Janvier 1892

CAPITAL SOCIAL 1200 MILLIONS DE GLOBES

BANQUE UNIVERSELLE

CONFÉDÉRATION DES BANQUES NATIONALES DE CHAQUE PAYS DE L'UNION MONÉTAIRE

30
GLOBES

UN GLOBE DE L'UNION MONÉTAIRE DE L'UNION

25 GRAMMES ARGENT 900 FIN

UNITÉ MONÉTAIRE DE L'UNION

30
GLOBES

VINGT GLOBES DE L'UNION

Usant du droit que chacune possède séparément, les Nations réunies en Congrès ont fixé un rapport de poids et un titre uniformes pour les métaux de leurs monnaies et ont adopté une unité monétaire internationale.

RAPPORT DE L'OR A L'ARGENT 15 1/2 UNIVERSEL

MONNAYAGE ILLIMITÉ TITRE 900 FIN

Adoptés par le Congrès de Paris Avril 1891 et irrévocablement ratifiés par chaque nation, comme BASES DE L'UNION MONÉTAIRE

L'échange monétaire universel de 1 kilo Or pour 15 1/2 kilos Argent ou 15 1/2 kilos Argent pour 1 kilo Or équivaut à la fusion des deux métaux en une seule substance de valeur uniforme et invariable.

Payables à vue en Or ou en Argent au choix du Porteur par une des Banques de l'Union

LA BANQUE DE FRANCE	par	100 francs.
" " BELGIQUE	"	100 "
" " SUISSE	"	100 "
" " ITALIE	"	100 livres.
" " ESPAGNE	"	100 pesetas.
" " HOLLANDE	"	100 guilders.

GARANTIS

INTÉGRALEMENT PAR UN DÉPÔT RÉCIPROQUE D'OR ET D'ARGENT DE CHACUN DES PAYS DE L'UNION

Espagne - États-Unis - France - Angleterre - Russie - Allemagne - Autriche - Scandinavie - Hollande - Italie

LA BANQUE D'ANGLETERRE	par	4 Pounds sterling.
" ETATS-UNIS	"	20 dollars.
" RUSSIE	"	20 roubles.
" ALLEMAGNE	"	80 marcks.
" SCANDINAVIE	"	80 kronas.
" AUTRICHE	"	40 florins.

Le Contrôleur: *R. Gimberly*

Le Gardé du Sceau: *Hauri Darin*

Le Gouverneur: *Emile Grunow*

Le Trésorier: *C. David*

Les Contrefacteurs seront poursuivis dans les pays de l'Union monétaire d'après la nouvelle loi internationale.

NOTE.—The back of this plate is the face of the bank-note for England.

REPUBLICQUE FRANCAISE
Paris le..... 1^{er} Janvier. 1892.....

LE PEUPLE FRANCAIS S'ENGAGE A PAYER PAR LA

BANQUE DE FRANCE
au Porteur à vue

CENT FRANCS
en Or ou en Argent 900 Fin
Représentant 20 Globes de l'Union

Le contrôleur Le Secrétaire G.^{al}
le Caissier Le Gouverneur

les Contrefacteurs seront poursuivis dans tous les pays de l'Union monétaire d'après la nouvelle loi internationale

ECONOMIC GEOLOGY OF ITALY.

In "Economic Geology of Italy," the supplementary volume of "I tesori sotterranei dell' Italia," the author, Mr. Wm. Jervis, enumerates all industrially valuable Italian minerals, and indicates where they occur and to what uses they are or have been put. As the peninsula is very rich in minerals, the record and description of these constitute an ample technical task which has been well performed by Mr. Jervis. But the work has another and unexpected feature. The Italian civilization, extending over about 3,000 years, has at nearly all times abundantly materialized in monumental buildings, the materials in which the author traces to the rock-beds where they were mined.

He shows that the Temple of Segesta in Sicily was built of the compact reddish limestone from the mountain near by, that the large flagstone pavement of the main avenues of Pompeii was derived from prehistoric lava, which still appears in Monte Somma, that the very quarries of Seeceto, Elba, which are in operation to-day, furnished the front pillars of Pantheon in Rome, that the Temple of Vespasianus at Brescia is built of liasstone from the ruins of Botticino Mattina at Brescia, that the columns of San Lorenzo, in Milano, were cut in paleozoic white crystal marble from Calico, at Como, etc., etc. The past is thus brought back to the present, as it were; it is showed so palpably connected with it that this mineralogical-industrial monography is apt to affect the reader as a poem. Sentiment is inseparable from remoteness, and its effect, when met accidentally, and produced unintentionally, is most powerful because most genuine.

SILVER COINAGE IN PERU IN 1889.

For several years past, as we learn from the *Boletin de Minas*, of Lima, the silver bullion from the various mining districts of Peru has been sent to the National Mint to be coined into *soles*, as Peruvian dollars are called, with the rare exception of an occasional doré bar, high in gold, being exported. Consequently, comparing the operations of the Mint one year with another a tolerably exact estimate can be formed of the progress and development of the mining industry of the country.

The following figures for the year 1889, taken from the books of the Mint, show a perceptible increase in the production of silver over past years. This increase has been noticed for many years, and it is probable that it will continue in the same or in an even greater proportion in the future.

In 1889 the Mint received 1,271 bars, of a gross weight of 66,019 kilograms 298 grams, whose value was \$2,842,530.73. There have gone into circulation \$2,875,000, or \$32,469.73 more than were received. This is owing to the fact that on January 1st, 1889, there was on hand in the Mint a stock of \$60,275.82, against \$27,806.55 for the corresponding period of the present year. During 1888 the Mint received \$2,429,651.38 in Peruvian bullion, being less than the production for 1885 by \$412,889.35, or 9,290 kilograms of fine silver. The total production for 1889, therefore, amounts to 63,956 kilograms 988 grams fine silver. There has been a reduction in the amount coined of \$512,419.83 as compared with 1888, inasmuch as in 1889 no silver, either from Chili or Bolivia, was received, as had been the case in the preceding year.

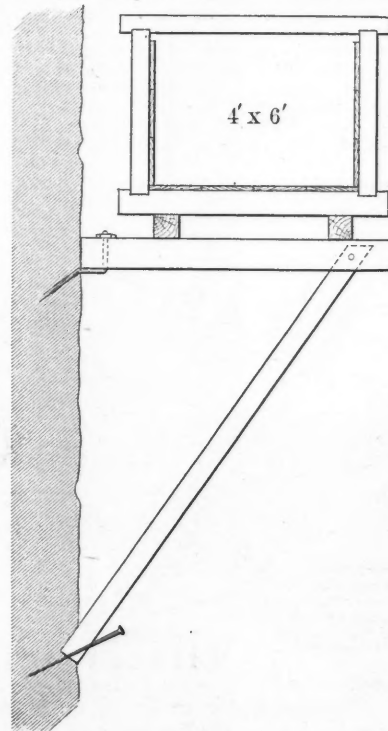
The increase in production is mostly owing to the districts of Cerro de Pasco and Recuay. Thus, while in 1888 Cerro de Pasco sent 498 bars, and Recuay 22, in 1889 there were received 540 bars from the former and 73 from the latter, an increase of production of 3,000 kilograms for Cerro de Pasco and 1,500 for Recuay. The mineral districts which at present produce the largest amount of silver are Cerro de Pasco, Castrovireina (or Santa Inés) and Recuay (or Ticapampa). The fineness of the Cerro de Pasco bars continues the highest, varying from .995 to .998, most of the silver being .998 fine. Then follow Ticapampa, .980 to .990 fine, and Santa Inés, .975 to .985 fine.

During 1889 a decrease has been noticed in the percentage of gold in all bars, with the exception of those from Cushuru. Bars containing

.001 of gold are now rarely received, while in former years .002 and .003 of gold were a common occurrence. During the present year there have been assayed 88 gold bricks, of a weight of 107 kilograms 996 grams. Although this represents but a part of the gold production of Peru, it shows how little developed are the numerous veins and the rich alluvial deposits which nature has, with such profusion and under conditions so so favorable for working, scattered on the eastern slopes of the Andes.

FLUME WORK OF THE MONTROSE PLACER MINING COMPANY.

We illustrate on this page an excellent example of a description of engineering work which is peculiarly American, a flume constructed on the face of a cliff, and which is a notable verification of the old proverb, that "necessity is the mother of invention." This branch of engineering



METHOD OF FASTENING FLUME TO CLIFF.
Montrose Placer Mining Company.

is simply the evolution of the necessities of the case; water had to be brought along the face of that cliff and in large bodies; pipes were out of the question, so another device had to be resorted to.

In this particular case the flume is located in a cañon on the San Miguel River, in Montrose County, Southwest Colorado. A large area of placer ground was purchased in that county by the Montrose Placer Mining Company, in September, 1887, and in the spring of 1888 the ground was prospected by the aid of the streams from melting snow and the trifling amount of water afforded by the Mesa Creek, quite a

Paris, le 1^{er} Janvier 1892

BANQUE UNIVERSELLE

CONFÉDÉRATION DES BANQUES NATIONALES DE CHAQUE PAYS DE L'UNION MONÉTAIRE

RAPPORTE DE L'OR A L'ARGENT
15 1/2 UNIVERSEL
MONNAYAGE ILLIMITÉ
TITRE 900 FIN
Adoptés par le Congrès de Paris
Avril 1891 et irrévocablement ratifiés
par chaque nation, comme
BASES DE L'UNION MONÉTAIRE

25 GRAMMES ARGENT 900 FIN
UNITÉ MONÉTAIRE DE L'UNION

20 GLOBES

20 GLOBES

VINGT GLOBES DE L'UNION

Payables à vue en Or ou en Argent au choix du Porteur par une des Banques de l'Union

<p>LA BANQUE DE FRANCE par 100 francs.</p> <p>» » BELGIQUE » 100 »</p> <p>» » SUISSE » 100 »</p> <p>» » ITALIE » 100 lires.</p> <p>» » ESPAGNE » 100 pesetas.</p> <p>» » HOLLANDE » 100 guilders.</p>	<p>LA BANQUE D'ANGLETERRE par 4 Pounds sterling.</p> <p>» » ETATS-UNIS » 20 dollars.</p> <p>» » RUSSIE » 20 roubles.</p> <p>» » ALLEMAGNE » 80 marcks.</p> <p>» » SCANDINAVIE » 80 kronas.</p> <p>» » AUTRICHE » 40 florins.</p>
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GARANTIS
 INTÉGRALEMENT PAR UN DÉPÔT
 RÉCIPROQUE D'OR ET D'ARGENT
 DE CHACUN DES PAYS
 DE L'UNION

Le Contrôleur: *R. Lambert* Le Garde du Sceau: *H. Darmy*
 Le Gouverneur: *Emile Guinot* Le Trésorier: *C. David*

Les Contrefacteurs seront poursuivis dans les pays de l'Union monétaire d'après la nouvelle loi internationale.

Ueant du droit que chacune possède séparément, les Nations réunies en Congrès ont fixé un rapport de poids et un titre uniformes pour les métaux de leurs monnaies et ont adopté une unité monétaire internationale.

L'échange monétaire universel de 1 kilo Or pour 15 1/2 kilos Argent ou 15 1/2 kilos Argent pour 1 kilo Or équivaut à la fusion des deux métaux en une seule substance de valeur uniforme et invariable.

small stream. The result, however, was so satisfactory that the company decided to build a ditch and flume to a point 10 miles above to San Miguel River.

There is about half and half ditching and fluming, and the latter has a fair claim to be considered a fine piece of engineering work, the flume being suspended on brackets and on benches. The total cost will be about \$75,000 when finished, and it is expected to be completed within a few months. The work is in charge of Superintendent N. P. Turner, who is an old experienced hydraulic miner. This work was commenced at the lower end, where the greater part of the flume is. This was done for the reason that the forest from which the lumber was obtained is located nearest that point. Now work is going on at the upper end where the river is tapped, and floating the lumber down the flume to where it is required. By this means it is hoped to have everything tight and no leakages to give trouble when hydraulicicking is commenced. This work will show how easy it is, when backed up by enterprising capital, to bring water from and to points which were always thought to be inaccessible.

The flume traverses the whole length of the Dolores Cañon, which is about four miles. It is fastened to the walls of the cliff, as shown in the views, and for a long distance is at an elevation above the river of 300 to 400 feet. It is very firmly built and has been fully tested to carry the volume of water which will pass through it when finished.

At a number of places the lumber has been piled in the flume as high as 13 feet and additional weight added to it without any noticeable variation. A large rock weighing many tons fell from the top of the cliff and only tore off a small section of 20 feet. It snapped off the heavy timbers as if they were matches, without loosening or even straining the supports a few feet further on. The break was entirely and fully repaired in two hours. The lumber is clear mountain pine, the wide boards and dimension pieces running full length, without sap and with very few knots. It is all well seasoned before being used.

In getting the levels the work was very dangerous, the man being lowered down over the cliff over 50 feet, marking in red paint the line to be followed by the construction gang. As the supporting timbers were put in place, the floor of the flume was laid and the derrick pushed out ahead, from which other supporting timbers were raised and secured to their places. Under favorable conditions and with a gang of 12 men, 250 feet per day have been erected. At one point on the line, nearly 200 feet long, the rock projects out, forming a sort of canopy, and is so shaped that it was impossible to support the flume on brackets, and it is hung from bolts, driven in overhead, on which the flume swings. Unfortunately, it was impossible to find a point where the camera would fully illustrate it.

In making the survey for this work the nature of the country necessarily made it a very difficult operation, as most of it had to be done by



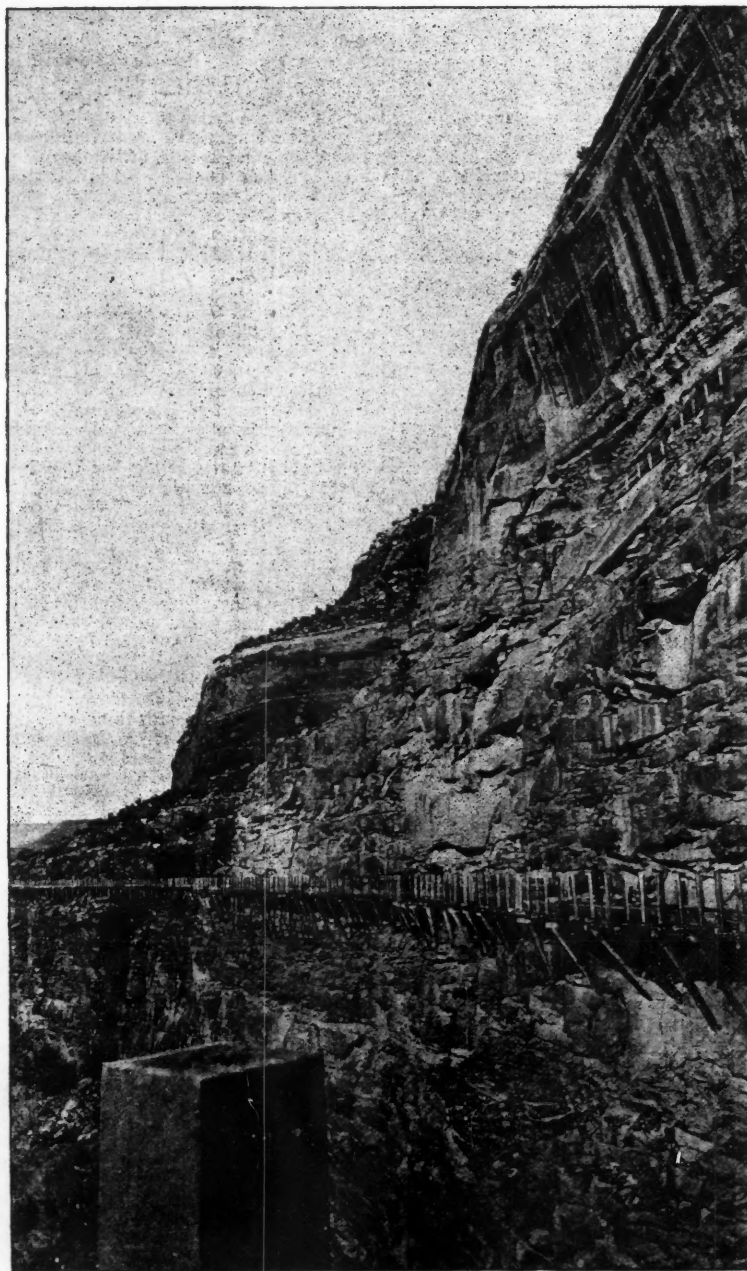
FLUME ON CLIFF 400 FEET ABOVE RIVER, MONTROSE PLACER MINING COMPANY.

triangulation. It is very creditable to be able to state that no mistakes were made except slight ones, which were easily corrected. The sketch shows the manner in which the flume is fastened to the cliff. The bolt shown is $1\frac{1}{2}$ inch in diameter, and is driven in the rock 18 inches, the shoulder which supports the weight being first bent to shape at the blacksmith shop. The long brace at the bottom rests on a shelf—natural, if it can be found, otherwise one is cut, and the pin is driven through this brace into the rock, and thus prevents it getting loose.

GEMS AND PRECIOUS STONES.

The *Tribune*, of New York, in its issue of May 14th, in a long and interesting review of Mr. George F. Kunz's beautiful book, says: "Gems; What May be Found in America.—The title of Mr. Kunz's book and the superb colored plates make an appeal to the imagination which seems

Stone, of Indianapolis, in its May number, says: "This book is a *chef d'œuvre* of the printer's and engraver's art. Its letter-press is brought out on the most durable, handsome paper, with new, large type, and embellished with lithograph *fac similes* of the various gems, both in their finished and natural state, so that the merest amateur may judge of the values, appearance and color of all the gem-stones found in North America. It is unnecessary to say anything of the work of Messrs. Prang & Co., but there is a crystal-like transparency of tint and color, and a fidelity of form that is a *vraisemblance* of the gem itself so strong and lifelike as not to be mistaken. Besides this, stones are classified by species and systematically and close in detail, and thorough in description. Amateurs, prospectors, archaeologists and jewelers will be instructed, and, we will add, pleased with it. If one would want general information on precious stones, that would enable him to buy or judge in-



FLUME ON CLIFF, MONTROSE PLACER MINING COMPANY.

well founded when we read that 'nearly all the known varieties of precious stones are found in the United States.' But, unhappily, Mr. Kunz deals with facts, and as he continues we are compelled to surrender all faith in the great carbuncle of the White Mountains, the diamonds of Arizona, and other dreams which have seemed as real as the gold of Stevenson's 'Treasure Island.' It is not a tale of the Arabian Nights which Mr. Kunz unfolds, but a remorselessly exact record, begun in 1882 for the unromantic report of the Division of Mining Statistics, and supplemented by travel and investigation. We believe that this book is the first important work devoted wholly to the subject, and it is certain that a publication so remarkably comprehensive, thorough and intelligent is unlikely to be superseded. It is pleasant to find a work of this consequence so satisfactory as an example of bookmaking and illustration. It is easy to agree with Mr. Kunz that the eight chromo-lithographic plates by Messrs. Prang & Co. are the finest of the kind ever executed."

telligently, the information for brain and eye are placed together. If one would care to hunt for them, evidence is given, unmistakable and true, where certain gem stones may likely abound, and how to determine them when found. The archaeologist who might wish to have a record of the historical stones of the past or present will find such description in this volume. The jeweler not only will find his best material described, but will learn of various ways that have been taken in making them. In short, this volume fills a want, and we will say a void, because we do not know of a published work where so much information has been so well presented, or so fully. It would be interesting to the itinerant reader, but it is invaluable to the investigator. It is so handsomely printed and bound that it would ornament a collection of curios. It is so full of instruction that the buyer of jewels, the finder of gems and the collector of curious information will find in it a mine of intelligent, artistic presentation of gems and their progeny.

To Save the Adirondacks.—A new association is now being formed for the preservation of the Adirondack forests, New York. A State forest park is to be established, and strenuous efforts will be made to secure the legislation necessary for the preservation of the forests. A large number of wealthy and prominent citizens of New York have interested themselves in the movement and have contributed money to its support and development. In the list are Chauncey M. Depew, Grover Cleveland, William C. Whitney, Ellis H. Roberts, John Claffin, Charles A. Dana, Eugene Kelly, Jesse Seligman, Alfred Loomis, J. Edward Simmons, Thomas C. Platt, Henry Clews, Warner Miller, and Mr. Grace.

Coloring Wine.—The Chilean Consul-General in London, in a communication regarding the use of the berries of a plant called the maqui for coloring wines, states that the maqui is a small evergreen shrub, common in Chili along the course of torrents and in shady mountainous woods. It is not cultivated, but grows wild, and the berries, which, in Chili, are eaten either fresh or preserved, are now beginning to be exported largely to Europe for the purpose of coloring wines. In the three years ending 1887 the exports were respectively as follows: 26,592 kilos., 136,026 kilos. and 431,392 kilos. To France alone the exports during the same years were, 500 kilos., 115,000 kilos. and 315,774 kilos. The berries are added to the grapes in order to give the wine a good color.

The Trade on the Great Lakes.—The tonnage annually passing through the "Soo" (Sault Ste. Marie) Canal is greater than that traversing the famous canal at Suez, according to the recently published "Inland Lloyd's Register;" the actual figures of the American fleet employed in the trade of the great lakes are a little less than 2,000 vessels, including 590 screws and 437 tugs, with a total net tonnage of 750,000, and of a gross value of more than £10,000,000 sterling. The last four years have seen an increase of nearly half the tonnage, and more than half the value, though the new vessels are in number only 206, or about one-tenth of the whole. Last winter nearly \$8,000,000 were put into new ships, and it is probable that the tonnage built during the season of 1890-91 will fully equal that of the present season. The figures for Canadian vessels would make a noticeable addition to the available capacity.

Profits of the "Ruined" Mines.—Among the incorporated but unlisted dividend payers in Colorado, of which the public seldom hears much, are the Aspen—not the Aspen Mining and Smelting Company—and the A Y and Minnie. The former has paid \$2,200,000 in dividends in the past fifteen months, while the latter pays \$600,000 a year regularly. The Smuggler of San Miguel pays \$2 a month on each share, while the Sheridan is reported as paying 33 per cent. The North Star, Virginus and Seven-Thirty are also all good payers, the whole number mentioned paying about \$4,000,000 per year in profits. Who says mining don't pay?—*Mining Industry.* [Certainly, mining pays, and pays so well it don't need to tax every other industry to live; but are not these the mines that want the whole nation to be taxed in order to increase the price of their silver, and that claim they will be ruined by the continued free importation of Mexican silver lead?—EDITOR ENGINEERING AND MINING JOURNAL.]

Irrigation of the Arid Lands.—The majority report prepared by the Irrigation Committee of the Senate says that more than two-fifths of the area of the United States, excluding Alaska, requires irrigation to insure regular crops. In at least four-fifths of the arid region irrigation is necessary. This region comprises 1,200,000 to 1,300,000 square miles. With dams and reservoirs at suitable places, a large extent of this could be made productive and the floods of the Lower Mississippi could be alleviated. The process of irrigation could be aided by boring artesian wells. All the country west of the eastern base of the Rocky Mountains requires irrigation except the part of Washington, Oregon and Northern California west of the Cascade Mountains and small areas in Eastern Oregon, Washington and Northern Idaho.

From the estimate of areas under cultivation submitted by the committee, it seems that the area under ditch is 13,561,000 acres, of which 4,000,000 are in California and 3,000,000 in Colorado. The amount cultivated by irrigation is 7,563,000, of which 3,300,000 are in California and 1,600,000 in Colorado. Projects under way last year and partially completed will bring the acreage under ditch up to 15,000,000 acres. The total value of the reclaimed land is nearly \$700,000,000. Allowing for the reclaimability of 100,000,000 acres out of the 1,800,000,000 of arid land, we have as a result a total real estate value of \$2,500,000,000. Seven-tenths of this whole area is now the property of the United States.

The minority report says that the arid lands embrace an area of 1,340,000 square miles, of which 100,000,000 acres can be redeemed for agriculture by using the total supply of the perennial streams.

Japanese Sulphur Mines.—The export of sulphur from Hakodate shows a decrease from 7,096 tons, value, £16,917, in 1887, to 3,609 tons, value, £8,681, in 1888. This is attributable almost entirely to the fact that no vessels could be induced to call at the port to take the sulphur away, the price, delivered in Hakodate (£2 3s. 6d. per ton), being sufficiently high to prevent its being shipped. The shipments last year went to San Francisco.

What prevents Japan from rivalling Sicily as a sulphur-producing country is the absence of facilities for increasing the output of sulphur, and for shipping it. At present there is only one place where sulphur is worked on any scale, and that is Atosanobori, near Kushiro, on the southeast coast of the island on which Hakodate is situated.

The Atosanobori mine is part of an extinct volcano. The sulphur covers a considerable portion of the slopes of the hill and of the sides of the old crater. Supposing the ore to be only 4 or 5 feet thick on the surface, there must be at this place over 1,000,000 tons of high-class ore. Recent borings (by Japanese) give the thickness of ore as 30 feet in some places, but it is probable that the richness of the ore decreases with the depth below the surface. It would be quite safe to count upon at least 5,000,000 tons of good ore. At present the ore yields over 50 per cent. of pure sulphur, a small portion of it being almost pure. The residue from the refining kettles would well repay a second treatment, as it appears to contain a considerable percentage of sulphur, as much as 15 per cent. probably, or about the average yield of the whole of the Sicilian sulphur ore.

The present output from Atosanobori does not exceed 10,000 tons of sul-

phur per annum (output about 9,000 tons in 1888). The cost of the sulphur, free on board at Kushiro, would be about 30s. 10d.

German Coal Mining Industry.—The coal trade of Germany had rather a trying time of it in the first quarter of this year, and its experiences during that time were appreciably different from those of several recent years. For some time past German coal-mining had been advancing by leaps and bounds, and many observers predicted for it a brilliant and unclouded future. In 1889, however, the German industrial horizon was seriously clouded over by labor difficulties. It had been supposed that the German working man was a model of sobriety, contentment and docility; but the experience of last year proved that he was much like his continental neighbors in respect of having an unappeasable desire to receive the highest possible wages for his labor. The discovery was suddenly made in the spring of 1889, and the consequence was a great derangement of the German coal situation. Production was paralyzed for some weeks by strikes of the most formidable character, and the result was that Germany had to import 4,573,209 tons of coal last year, as compared with 3,252,409 tons in 1888, showing an increase of 1,320,800 tons. At the same time, the exports of coal from Germany declined last year to 8,860,217 tons, as compared with 9,460,258 tons in 1888, showing a decrease of 600,041 tons last year. Germany also imported 387,395 tons of coke, as compared with 268,635 in 1888, showing a decrease of 103,291 tons. In both cases we find practically similar results, viz., materially increased imports and sensibly decreased exports. It is right to observe that the state of affairs indicated by these figures was not solely attributable to labor difficulties, the general increase of manufacturing and industrial activity which characterized European life in 1889 having extended also to Germany, so that the home consumption of coal was increased as the output was reduced, thus aggravating the effect of the labor difficulties to which we have just referred.—*Kuhlou.*

The Yield of Victorian Gold during 1889 is estimated at 615,055 ounces, or 21,145 ounces less than in 1888, when it was 636,200 ounces. In 1887 it was 611,417 ounces, and in 1886 it was 640,872. A "prospecting vote" of £20,000 per annum is distributed by the government among companies engaged in prospecting for gold, but the discoveries which have resulted are few and unimportant. Nearly all the gold raised is now obtained from quartz, little alluvial mining being carried on, and more expensive machinery is required by the former than by the latter. The wonderful development of the Broken Hill silver mines has also diverted public attention from gold mining. Greatly improved yields have recently been obtained from some of the gold mines in the Sandhurst district. In the Hercules & Energetic mine quartz showing gold was met with on the 4th inst. at a depth of 1,070 feet. Sixteen tons of the quartz, being retorted, gave 1,650 ounces of amalgam, which, with 144 ounces from elsewhere, yielded 857 ounces gold. The shares jumped in one week from 17s. 6d., at which they were unsalable, to 48s. 6d. Other companies have also obtained excellent results. About two years ago another company worked a very rich shoot at about 1,060 feet, one crushing yielding 11 ounces per ton, and about eighteen months ago a different company worked a very rich patch at 1,060 feet, several lots of quartz yielding 10 ounces per ton. The gross yield of gold for the colony of Queensland in 1889 was 737,822 ounces (which may be increased by more complete returns), against 481,643 ounces in 1888, an increase of 256,179 ounces. In 1887 the yield was 425,923 ounces. The increase in 1889 was largely due to the greatly enlarged yields from the Mount Morgan mine, near Rockhampton. The returns from this mine for the 12 months ending November 30, 1889, were 323,542 ounces, equal to 4 oz. 6 dwt. 4 grs. per ton, and the total amount paid in dividends by the company during the 12 months was £1,100,000. The yield for 1889 places Queensland at the head of the Australasian colonies as regards gold production.—*Bradstreet's.*

Improvements in the Manufacture of Copper.—The improvements in copper smelting, by P. C. Gilchrist, relate to the separation of copper from impurities, more especially arsenic, antimony and tin. In the roasting of white or pimple metal for the production of blister copper, in the treatment of metallic bottoms for the removal of arsenic and conversion into blister or into refined copper, and also in the toughening and refining of blister copper, reverberatory furnaces are used lined with shrunk dolomite, magnesite, chrome iron ore, or other basic or neutral lining, by which means it is possible to maintain during the operation of refining a basic slag instead of the acid slag as hitherto. A purer product is thus obtained, together with a larger yield and increased output. It has been found that a suitable amount of lime to add when charging white metal containing 75 per cent. of copper, is from two to three cwt. per seven tons of white metal charged. The metal should be melted down slowly under air. Much less slag will be formed than is usual in sand-lined furnaces. A good heat should be kept on the furnace throughout the charge. It is often advantageous to add a few shovelfuls of lime to the slag shortly before tapping the charge. Care must be taken not to form too thick a slag or the operation will be retarded. It is often convenient to charge in also some copper oxides or slags, and to subject the surface of the bath to the action of an air blast, the oxidizing action of which materially assists the diminution of the arsenic. The object of the smelter should be to obtain as little slag as possible, and with a low percentage of copper in it. Skimmings of slag should be made three or four times, as desirable. When the sample begins to show a blister fracture a few shovelfuls of lime are to be added once or twice until the bath is ready for tapping. The slags obtained when working as described will not average more than 30 per cent. of copper, whereas when working with the ordinary sand bottom the slag usually averages 55 per cent. of copper, besides weighing considerably more per ton of blister produced. It was found when treating 400 tons of metallic bottoms in a basic-lined furnace that there was obtained 323 tons of blister and 107 tons of slag, averaging 25 per cent. of copper, and that when treating an equal weight of metallic bottoms in a sand-lined furnace there was obtained 191 tons of blister only, and 221 tons of slag, averaging 55 per cent. of copper. A slag in which there is no more silica than 20 per cent. should be worked with, as with more siliceous slags the elimination of the impurities takes place more slowly.—*Jour. Soc. Chem. Ind.*

BOOKS RECEIVED.

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

Annual Statistical Report on the Home and Foreign Iron and Steel Industries in 1889. By the Secretary of the British Iron Trade Association. Published by E. & F. N. Spon, London and New York. Pages, 112. Price, \$2.

Caspar's Directory of the American Book, News and Stationery Trade, Wholesale and Retail. By C. N. Caspar. Published by the compiler, Milwaukee, Wis., 1889. Cloth, large 8vo., in 2 vols., 1,434 pp. Price \$12. This is a very convenient and well-arranged directory of the publishing trade. It gives a list of all firms in a general alphabet, a digest of the trade lists of the various publishers, an abstract of the trade lists of manufacturing and jobbing stationers, a list arranged geographically, a classification according to trade branches and specialties of periodicals, and a large amount of miscellaneous information, such as hints and suggestions, bibliographies, etc.

Geological Survey of Missouri, Bulletin No. 1. By Arthur Winslow, State Geologist. Published by the Geological Survey, Jefferson City, Mo. 1890. Pages 85.

Silver in Europe. By S. Dana Norton. Published by Macmillan & Co., New York, 1890. Pages, 290. Price \$1.50.

The Elements of Laboratory Work—A Course of Natural Science. By A. G. Earl, M. A., F. C. S., Science Master at Tonbridge School, Tonbridge, England. Published by Longmans, Green & Co., London and New York, 1890. Pages, 179. Price, \$1.40.

The Physical Properties of Gases. By Arthur L. Kimball. Published by Houghton, Mifflin & Co., Boston and New York, 1890. Pages, 237. Illustrated. Price, \$1.25.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

PATENTS GRANTED TUESDAY, MAY 6TH, 1890.

- 427,047. Dumping Car. Emile Chevalier and Louis Buette, Paris, France.
- 427,055. Sifting Showel. Maria J. Cushing, New York, N. Y.
- 427,058. Apparatus for Separating Lead and Lead Bullion from Slags, Mattes, and Speiss. Walter B. Devereux, Glenwood Springs, Colo.
- 427,060. Centrifugal Pump. Joseph Edwards and James R. F. Kelly, Brooklyn, N. Y.
- 427,074. Steam Boiler. John A. Groshen, New York, N. Y., Assignor of one-half to Richard M. Macdonough, same place.
- 427,080. Brake for Railway Cars. George M. Hoadley, and Sumner A. Bemis, Springfield, Mass.
- 427,085. Friction Clutch. Arthur W. Jones, Boston, Mass.
- 427,124. Coal Separator. William H. S. xton, Dugger, Ind.
- 427,149. Apparatus for Submarine Exploration. Calvin Brown, San Francisco, Cal.
- 427,150. Wire Drawing Machine. James E. Burnes, Waterbury, Conn.
- 427,151. Method of and Apparatus for making Rolled Forgings by Electricity. George D. Burton, Boston, Mass.
- 427,153. Dumping Wagon. Edward T. Callahan, Omaha, Neb.
- 427,167. Heat Insulating Compound. Nathaniel C. Fowler, Boston, Assignor to Edward G. Fowler, Cambridge, Mass.
- 427,171. Steam or other Engine. Henry Grafton, London, England.
- 427,184. Coal Chute. Reuben A. McCauley, Baltimore, Md.
- 427,197. Carburetor. William H. Shannon, Stockton, Assignor of one-half to John H. Crystal, Ceres, Cal.
- 427,210. Apparatus for utilizing waste gases from coke-ovens. Colin C. Wylie, London, County of Middlesex, England, Assignor of one-half to James P. Witherow, Pittsburg, Pa.
- 427,212. Car Coupling. Ebenezer S. Bacon and Albert F. Sellers, Detroit, Mich.
- 427,213. Street Railroad Chair. John M. Bailey, Goodson, Va.
- 427,214. Street Railroad Rail. John M. Bailey, Goodson, Va.
- 427,222. Car-Coupling. Isaac Bradford, Pomeroy, Ohio.
- 427,225. Carburetor. James J. Cooper, Philadelphia, Pa.
- 427,228. Pulverizing Machine. George S. Finney, Chicago, Ill.
- 427,231. Steam Engine. Henry Grafton, 26 Willes Road, Kentish-Town, County of Middlesex, England.
- 427,249. Hydraulic Jigging Sieve. Oscar Bilharz, Freiberg, Saxony, Germany.
- 427,250. Percussion frame with revolving belt for the treatment of ores. Oscar Bilharz, Freiberg, Saxony, Germany.
- 427,251. Jigger for treating ores. Oscar Bilharz, Freiberg, Saxony, Germany.
- 427,257. Friction Clutch. John D. Ehrmann, Kaukauna, Wis. Assignor to the Atlas Brass and Iron Works, same place.
- 427,264. Safety Valve. Richard Iwanowitsch, Penzing, near Vienna, Assignor of two-thirds to Carl Peklinger, Floridsdorf, and Magdalen Karder, Vienna, Austria, Hungary.
- 427,266. Feed Water Heater. Fred. E. McGahan, Indianapolis, Ind.
- 427,273. Combined Ditching Machine, Grader and Loader. William H. Sanford, Mountain Home, Ark.
- 427,288. Rolls for reducing and straightening metal rods. Winslow Allderdice, Warren, Ohio, Assignor of one-half to Junius Dana, same place.
- 427,294. Dynamo-Electric Machine. De Witt B. Brace, Lincoln, Neb.
- 427,299. Natural Gas-Burner. Charles H. Carpenter, Richmond, Ind.
- 427,301. Anti-Friction Wheel. Charles G. Deming, Woodstock, N. Y.
- 427,303. Journal Box for Car Axles. William O. Dunbar, Altoona, Pa.
- 427,310. Car-Coupling. Marion M. Green County, Line, Tenn.
- 427,314. Transferring Apparatus. William C. Hanson, and Leonidas C. Ferrell, New Orleans, La.
- 427,315. Rail Brace. George Hargreaves and Samuel A. Baugh, Detroit, Mich.
- 427,339. Method of and Apparatus for Tunneling. Samuel Mattson, Jersey City, N. J.
- 427,344. Clutch. John W. Moore and Joseph A. White, Philadelphia, Pa.
- 427,348. Rail and rail chair. Arthur J. Moxham, Johnstown, Pa.
- 427,349. Rolling Mill. Arthur J. Moxham, Johnstown, Pa.
- 427,367. Hydrocarbon Furnace. Newton Rogers and James A. Wharry, Terre Haute, Ind.
- 427,371. Car-Coupling. Everett Scott, Roaring Creek, W. Va.
- 427,380. Method of establishing units of measure in compounding Portland cement. Edward N. Trump and Duncan W. Peck, Syracuse, N. Y.
- 427,384. Railway Tie. Lewis Wallace, Crawfordville, Ind.
- 427,396. Vapor and Ammonia Engine. Joseph H. Campbell, New York, N. Y.
- 427,399. Method of operating vapor or ammonia engines. Joseph H. Campbell, New York, N. Y.
- 427,400. Apparatus for operating vapor or ammonia engines. Joseph H. Campbell, New York, N. Y.
- 427,401. Aqua Ammonia Engine. Joseph H. Campbell, New York, N. Y.
- 427,433. Process of separating and cleansing coal and other minerals. Carl Ludwig Dresden, Saxony, Germany, and John C. Cuninghame, Glasgow, Scot, land.

- 427,438. Miners' Spectacles. Felix G. McConihay, Lewiston, W. Va.
- 427,441. Ore Crusher. Elias D. Roth, Fort Collins, Colo.
- 427,442. Amalgamator. Elias D. Roth, Fort Collins, Colo.
- 427,451. Self-Lubricating Axle. Thomas J. Weaver, Columbiana, Ala.
- 427,452. Combined fish plate and chair for railways. George A. Weber, New York N. Y., Assignor to Caroline C. Weber, same place.
- 427,467. Obtaining chlorine. Richard Dormer, Garston, County of Lancaster, Eng land.
- 427,487. Carburetor. Jonathan S. Tibbets, Jeffersonville, Ind.
- 427,492. Apparatus for transmitting and converting motion. Edward Wright, Worcester, Mass.
- 427,505. Railway Joint. Frederick T. Fearey, Newark, N. J., Assignor to the Continuous Rail Joint Company of America, of New Jersey.
- 427,512. Railway Rail Joint. John Hiron, Wellington, Kan., Assignor of one-half to Martin V. B. Holms, same place.
- 427,513. Electro-plating Bath for Copper. William B. Hollingshead, Bronxville, N. Y., Assignor to James E. Batterson, Hartford, Conn.
- 427,526. Coal Screen. James C. Simpson, St. Louis, Mo., and Lewis Stockett, Colinsville, Ill.

TUESDAY, MAY 13, 1890.

- 427,538. Anti-Friction bearing. Bruno Beaupre, St. Paul, Minn.
- 427,539. Anti-Friction bearing roller journal. Bruno Beaupre, St. Paul, Minn.
- 427,551. Ore Concentrator. Stephen L. Burke, St. Louis, Mo., Assignor of five-sixths by direct and mesne assignments, to Francis M. Jenks, William A. Jenks, John C. Nial, Charles L. McDonald, Robert Carrick, and Israel E. Russell, all of the same place, and John Schaffer, Kirkwood, Mo.
- 427,552. Turbine water wheel. Nathan F. Burnham, York, Pa.
- 427,557. Rivet Setting Machine. Henry H. Cummings, Malden, Mass.
- 427,563. Friction clutch. William D. Ewart, Chicago, Ill., Assignor to the Link Belt Machinery Company, same place.
- 427,575. Lubricator. Edward Hubar, Marion, Ohio.
- 427,577. Switch Operating Device for Railway Cars. Joseph Kelly, Pittsfield, Mass.
- 427,578. Brick Machine. Robert Knickerbocker, Blue Island, Assignor of one-half to Charles F. Wardell, Chicago, Ill.
- 427,595. Hydrocarbon Burner. Wilson S. More, Ellicott and John G. Rogers, Jamestown, N. Y.
- 427,602. Car-Coupling. Alexander McDougald, Madawaska Station, Ontario, Canada, Assignor to himself, M. J. Grady and W. W. Roche, same place.
- 427,629. Water-Wheel. Hortensius C. Simpson, Shrewsbury, County of Salop, Assignor to the Universal Water Power Company, Limited, London, England.
- 427,633. Apparatus for Feeding Boilers or Water Tanks. Joel W. Stevens, Chicago, Ill., Assignor to himself and Robert Bines, same place.
- 427,640. Car-Axle Boxing. William T. Trissal, Indianapolis, Ind., Assignor of two-thirds to Millard F. Cox, same place, and Perry C. Swiggert, Lebanon, Ind.
- 427,646. Friction-Clutch. Sern P. Watt, Columbus, O.
- 427,654. Glass-Furnace. John B. Archer, Washington, D. C.
- 427,658. Pipe Section. James C. Bayles, New York, N. Y.
- 427,659. Pipe or Tubing. James C. Bayles, New York, N. Y.
- 427,674. Carbon Brush and Motors. Leo Daft, Plainfield, N. J., Assignor to the Daft Electric Light Company, N. Y.
- 427,679. Dynamite. Pierre Germain, Clermont-Ferrand, France.
- 427,683. Car-Coupling. James B. Granger, Delhi, N. Y., Assignor of one-half to Aaron Stearn, same place.
- 427,690. Crushing Mill. Frank A. Huntington, San Francisco, Cal.
- 427,691. Anti-Friction Support for Cars. Luther K. Jewett, Boston, Mass., Assignor to the Jewett Supply Company, Portland, Me.
- 427,692. Side Bearing for Car-Bodies. Luther K. Jewett, Boston, Mass., Assignor to the Jewett Supply Company, Portland, Me.
- 427,693. Anti-Friction Bearing. Luther K. Jewett, Boston, Mass., Assignor to the Jewett Supply Company, Portland, Me.
- 427,701. Metallurgical Apparatus. William H. Masser, Los Angeles, Cal.
- 427,706. Car-Brake. Charles W. Powell, Green Island, N. Y., Assignor of one-fourth to William H. Powell, same place.
- 427,707. Mixer for Explosives. William R. Quinan, Pinole, Cal.
- 427,725. Electric Railway. Edward M. Bentley, New York, N. Y.
- 427,726. Contact device for electric railways. Edward M. Bentley, New York, N. Y.
- 427,728. Well lining. Albert Blackmon, Sweet Home, Texas.
- 427,737. Car-Coupling. Henry C. Buhoup, Chicago, Ill., Assignor to William McCoway, Pittsburg, Pa.
- 427,740. Machine for making and repairing roads. Morton G. Bunnell, Chicago, Ill., Assignor to Frederick C. Austin, same place.
- 427,744. Process of obtaining chlorine compounds from natural gas. Theodore F. Cohn, Pittsburg, Pa., Assignor of three-fourths to Levi Shook and James Bishop, same place, and T. J. Vandergrift, Jamestown, N. Y.
- 427,751. Electrical Converter. Sebastian Z. de Ferranti, Hampstead, County of Middlesex, England.
- 427,758. Car-Coupling. Simeon J. Ford, Placerville, Cal.
- 427,768. Process of treating metals. Horace K. Jones, Hartford, Conn.
- 427,784. Duplex Steam Pump. John H. McGowan, Cincinnati, O.
- 427,786. Welding Compound. Henry S. McLeod, Cambridge, Mass.
- 427,792. Apparatus for Producing and Maintaining High Vacua. John Pattern, New York, N. Y., Assignor to the John Pattern Manufacturing Company, same place.
- 427,809. Pneumatic Car Motor. Henry Taylor, Baltimore, Md., Assignor of three-eighths to Henry Taylor, Jr., James A. Taylor and George Taylor, all of same place.
- 427,812. Combined Joint Bar and Railway Tie. Lewis Wallace, Crawfordville, Ind.
- 427,813. Railway Cross Tie. Lewis Wallace, Crawfordville, Ind.
- 427,814. Metal Pad for Metal Railway Tie. Lewis Wallace, Crawfordville, Ind.
- 427,816. Railway Car Axle. Charles W. Wolfe, Albany, and Thomas H. Campbell, Green Island, N. Y.
- 427,819. Hydrocarbon burner. John Adams, Nashville, Tenn.
- 427,830. Automatic dumping bucket for hoisting and conveying machines. Alexander E. Brown, Cleveland, O.
- 427,832. Carbureting apparatus. George Burrows, Somerville, Mass.
- 427,837. Machine for making castings. Frederick N. Cline, Chicago, Ill., Assignor to Rockwell King, same place.
- 427,851. Dumping cart. Charles Gihhs, New York, N. Y.
- 427,867. Petroleum car. William H. Hill and Charles W. Bender, Utica, N. Y.
- 427,871. Coal mining machine. William Joh. Columbus, O.
- 427,880. Car axle box. William M. Leckie, Joplin, Mo.
- 427,885. Water wheel. Lee Middleton, Clarksville, Mo.
- 427,893. Hydrocarbon burner. Alonzo Noteman, Toledo, O., Assignor to Alonzo H. Calkins, Evanston, Ill.
- 427,908. Car coupling. Joseph Rigby and George W. Reed, Seattle, Wash.
- 427,910. Car-hrake. Frederick W. Rock, Detroit, Mich.
- 427,911. Wind Engine. Timothy Rogers, Springfield, Ohio, Assignor of one-half to Henry Voll, same place.
- 427,930. Clutch for Holding Disks. Theodore Suchland, Berlin, Germany.
- 427,933. Forge Tweezer. Clarence G. Taylor, Ann Arbor, Mich., and William T. Angell, St. Louis, Mo.
- 427,946. Hydrocarbon Burner. John Adams, Nashville, Tenn.
- 427,952. Rotary Engine. Walter H. Avis, Dovercourt, Assignor to Robert Charles Fisher, Toronto, Ontario, Canada.
- 427,966. Motor Car. George M. Brill and John A. Brill, Philadelphia, Pa.
- 427,969. Welding Compound. William G. Clark, Hergott Springs, South Australia.
- 427,971. Method of Electric Welding. Charles L. Coffin, Detroit, Mich.
- 427,978. Alternating Current Motor. Michael von Dollvo-Dohrowitskys, Berlin, Germany, Assignor to the Company Allgemeine Elektricitats-Gesellschaft, same place.
- 427,980. Coal or Dredge Bucket. Carl Eibee, Brooklyn, N. Y.
- 427,987. Apparatus for the Transmission of Rotary Motion. Augustin H. Hamon, Paris, France.
- 427,994. Car-Axle Lubricator. Joshua R. Hosier, Hampton, Va.
- 427,997. Endless Chain Water Elevator. Robert H. Hufey, M'Lees City, Mont.
- 428,017. Process of making White Lead. Alexander Orr, Glasgow, County of Lanark, Scotland.
- 428,021. Apparatus for Sinking Shafts. Richard P. Rothwell, New York, N. Y.
- 428,048. Friction Clutch Pulley. Hilton R. Horton, St. Louis, Mo., Assignor of one-half to Milton F. Williams, same place.
- 428,046. Turbine Water Wheel. John Humphrey, Akron, O., Assignor to the Humphrey Turbine Company, same place.

PERSONA S.

Mr. John Williams leaves to-day for Canada on professional business. Letters addressed to him at 27 Park Place will be forwarded.

Mr. J. A. Macpherson, a prominent member of the Consolidated Stock and Petroleum Exchange, of New York, will leave for Arkansas next week to look after some zinc properties which have been placed in his hands for sale.

—Mr. George W. Maynard, mining engineer of New York, and president of the Osceola Gravel Mining Company, started this morning on a three months' tour through Colorado, Nevada and Idaho. Communications sent to his Nassau street office will be promptly forwarded.

Mr. James Lee, more familiarly known by all who have had connection with the Consolidated Stock and Petroleum Exchange, as "Jimmy" Lee, has been elected to membership in that exchange. Mr. Lee has been with the exchange since its organization and has remained with it through all its consolidations. He will devote himself to miscellaneous securities, paying special attention to mining stocks.

OBITUARY.

W. W. Thurston, president of the Bethlehem Iron Company and president of the Juricaga Iron Company of Cuba, died in London, England, on the 13th inst., aged thirty eight years. He was returning with his family from a trip along the Nile, where he had gone for his health.

Franklin H. Tinker died at Short Hills, N. J., on the 13th inst., at the comparatively youthful age, when estimated by his achievements, of thirty-six years. Mr. Tinker was a member of the publishing firm of Root & Tinker. Few men of his age were more widely known in this country and abroad, by reason of his irrepressible energy and enterprise, which were originally shown in the publication of books and portraits of representative men, which gained great popularity. He was a pioneer in the field of trade journalism, and projected, and was largely interested as proprietor and manager in many of such publications. He was the treasurer and managing director of the company publishing the *Oil, Paint and Drug Reporter*, and was also extensively interested in the *Hairer and Furrier*, the *Clither and Furnisher*, the *American Exporter*, the *Dry Goods Economist*, besides other trade journals. Mr. Tinker was noted among his associates as a collector of rare and choice books, and was reputed to be the possessor of presumably the finest collection of the first editions of the works of Charles Dickens in America. His library also contained many other valuable books and autographs.

SOCIETIES.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

This society will hold its annual meeting for the election of officers at the house of the American Society of Civil Engineers, No. 127 East Twenty-third street, New York, on Tuesday evening, May 20th, at 8 o'clock. The terms of the president, three vice-presidents, four managers, the treasurer and secretary expire on that date. Prof. Elihu Thomson is the present president of the institute. After the completion of the regular business of the meeting, a paper on the subject of "Electricity in the Navy" will be read by Gilbert Wilkes, late of the United States Navy.

The general meeting of the institute will be held on the following day, Wednesday, May 21, in Boston. Those who attend the annual meeting for the election of officers and the general meeting also, will go to Boston by the Shore Line train at midnight. The general meeting, for the reading and discussion of professional papers will be held in the "new building" of the Massachusetts Institute of Technology, corner of Boylston and Clarendon streets. The proceedings will be opened by an address by Francis A. Walker, Ph.D., LL.D., president of the Institute. After a response by the president the following papers will be read at the morning session: "Electric lighting in the Tropics," by Wilfred H. Fleming, of New York; "Magnetic Data of the Sprague Steel Car Motor," by H. F. Marshall, of New York; "Notes on a New Photometer," by Dr. Edward L. Nichols, of Ithaca, New York; "The Limitations of Steam and Electric Transportation," by Oscar T. Crosby, of New York.

At the afternoon session, Thomas D. Lockwood of Boston, will read a paper on "The Industrial Utilization of the Counter Electro-Motive Force of Self Induction." Other papers will be: "A Study of Arc Light Carbons," by Louis B. Marks, of Cornell University; "The Practical Aspects of Alternating Current Theory," by Dr. Michael I. Papin, of New York; "Automatic Electric Welding Machines" (with experimental demonstration), by Hermann Lemp, Jr., of Lynn, Mass.

On Wednesday evening the institute will be the guest of the Boston Electric Club at a dinner to be served at the Parker House. A paper on "The Relation Between Fire Insurance and Electric Interests, from the Underwriters' Standpoint," will be read by E. Barton, of Boston.

ENGINEERS' CLUB OF PHILADELPHIA.

The club held its regular business meeting May 3d. Messrs. A. H. Haig and Barton H. Coffey, the tellers of election, reported that only 124 votes had been cast for and against the amendment to increase the dues of resident active members and associate members by \$2.50 per annum, for the purpose of creating a fund to provide a lunch after each of its meetings. Seventy-six of these votes were in favor of the amendment, and 48 against it. It, therefore, lacked the necessary two thirds majority, but the vote was so small, and it seemed as if there might be some misapprehension on the subject, so the amendment was again submitted by Messrs. Howard Murphy, Edward Hurst Brown, and M. R. Mucklé, Jr.

The secretary presented, for Mr. William H. Dechant, a paper on the Mountain Railroads of Reading, Pa. The city of Reading and its surroundings are generally described and full description given of these roads.

The paper was accompanied by a topographical map which had been made by Mr. E. V. d'Inwilliers. On this map the alignments of the roads have been placed, at the instance of Mr. d'Inwilliers, thus giving an excellent idea of their character and surroundings.

The scenery, from numerous stretches of these railroads, is grand and beautiful. Their accessibility from Philadelphia and other cities is a great advantage.

They are operated in general as gravity roads usually are.

The secretary presented, for Mr. J. Foster Crowell, a paper on the Inter-oceanic Canal Prospect in 1890 from Notes on the Spot in Panama and Nicaragua. He describes the extravagant ruins of machinery and executed work which prevail along the Panama Canal, and expresses his opinion that its completion is utterly hopeless. On the other hand, he expresses every confidence in the economical and satisfactory completion of the Nicaragua route.

Mr. Edwin S. Crawley presented a paper, translated from the French—*Nouvelles Annales de la Construction*—on the Lobnitz System for the Demolition of Rocks Under Water without Explosives. The principle of the system consists in producing a shattering of the rock by the action of a heavy mass let fall from a convenient height and acting like a projectile upon the wall of a fortress. Owing to the lateness of the hour the other papers set down for the evening were deferred.

THE ENGINEERING ASSOCIATION OF THE SOUTHWEST.

(Report by Our Special Correspondent.)

The regular May meeting of the Engineering Association of the Southwest was held at the Y. M. C. A. building, Nashville, Tenn., on the evening of May 8th, Treasurer Dr. W. L. Dudley presiding, with the usual attendance of visitors and members.

Messrs. Kenneth McDonald and Donald McDonald, members of the firm of McDonald Bros., architects, of Louisville, Ky., were elected as members, and Mr. Dexter Belknap, cement manufacturer, of Louisville, Ky., was elected as associate.

The report of the Executive Committee on the matter of affiliation with the American Society of Civil Engineers, which had been referred to the committee at the April meeting, was presented. The report recommended that the Association maintain its independence in all matters of business management, ownership of property and qualification for membership, but favors an affiliation with the American Society so far as pertains to the publication of papers, the exchange of papers and periodicals, a systematic provision by which accredited members of each organization shall attend the meetings of other organizations and a systematic co-operation in the extension of mutual courtesies to members and strangers. The report presents at some length the views of the committee on the general relation of engineering societies to one another, maintaining that as three distinct divisions of functions exist, those of a purely general nature, those of a professionally special nature, and those of a purely local nature, that corresponding distinctions should be made in the organization and scope of engineering societies and suggests that there should be one national organization which should deal only with matters of the first class, namely, those of a purely general nature, but that such organization might divide itself into special sections for the consideration of matters of a professionally special nature.

As a means of accomplishing the above classification of society work, the report suggested the advisability of the consideration on the part of the American Society of Civil Engineers, whether or not a certain co-ordination might not be entered into by that body and the American Society of Mechanical Engineers, the American Institute of Mining Engineers, the American Institute of Electrical Engineers and the American Institute of Architects, the several societies retaining their independent character so far as concerns their individual government and the treatment of matters falling in their own specialties, but acting together as a unit on matters of a purely general nature which affect all of several branches of engineering in common. An incidental advantage of such a

federation being that, by united efforts, the several societies could together provide a building in common which should meet the general as well as the special requirements of each of the several societies, the same being true of a library in common and a general publication containing the transactions of each society. After some discussion the report was unanimously adopted, and a committee composed of President John MacLeod, Secretary Olin H. Landreth and Vice-President W. F. Foster, was appointed to represent the Association before the meeting of the special committee of the American Society, in New York, in June, at which time representatives of the several local organizations have been invited to meet with the committee of the American Society.

Duty Tests of Pumping Engines.

Mr. George Reyer, superintendent of the water works, Nashville, Tenn., then read his paper, entitled "The Recent Duty Test of the Holly-Gaskill Pumping Engine at the Water Works, Nashville, Tenn."

The object of the test was to determine whether or not the engine erected at the new pumping station, by the Holly Manufacturing Company, was capable of pumping 10,000,000 gallons of water from the Cumberland River, the source of supply, into the reservoir on Kirkpatrick's Hill, each 24 hours, and performing a duty of 82,000,000 foot pounds for each 100 pounds of coal consumed on a basis of evaporation in the boilers of eight pounds of water for each pound of coal consumed.

The engine is a vertical compound condensing engine, having two high-pressure cylinders 33 inches in diameter, and two low pressure cylinders 66 inches in diameter, with overhead beams. The ends of the beams are extended beyond the high pressure cylinder to allow the insertion of a connecting rod pin. The lower ends of the two connecting rods are attached to the cranks, which are placed at an angle of ninety degrees with each other. A fly-wheel, 24 feet in diameter, is placed on the main shaft, and is common to both engines.

The pumps are single-acting, plunger pumps, 27 inches in diameter. These pumps are placed directly under the steam cylinders, in a dry well, the distance from the base of pumps to the bed plate of engine being 58½ feet. The pump rods being an extension of the piston rods, the plungers are driven directly by the pistons, and the stroke of both piston and plunger is five feet. The condenser is a surface condenser, part of the water from the force main passing through the tubes of the condenser, and then back into the main, so that the water used for condensing is not wasted. There are four air pumps and four feed pumps connected to and driven by the main engine.

The water pumped was measured in the reservoir, allowance being made for leakage and evaporation. Measurements were made by the city engineer, showing the capacity of the reservoir in United States gallons for each six inches of depth from 0 feet to 31 feet. The arrangement used for measuring the height of water in the reservoir consisted of an electric battery and bell, a light wooden float, having a copper plate on its upper surface, a steel tape, and a return wire. This was so arranged that when the end of the tape touched the copper plate, the observer was notified by the bell and the reading could be taken. The boiler feed water was weighed in a tank. Records were kept of the weight of coal consumed, the ashes made, the water trapped from steam main before reaching engine, and dryness of steam at engine by a barrel calorimeter. Indicator cards were taken daily.

Readings were taken every half hour, of the steam pressure, water pressure and vacuum gauges, revolution counter, temperature of water in overflow from air pumps, level of water in the wet well, and temperature of water in the feed water tank.

Corrections were determined and applied for leakage in reservoir and force main, rainfall during test, the water trapped from steam main, the steam used in calorimeter and in feed pumps, variations in height of water in boiler at beginning and end of test.

Results, Duration of test, 4 days, 8 hours and 52 minutes. Total U. S. gallons pumped, 49,776,680. Average head pumped against, 268.7 feet. Actual duty of boiler and engine per hundred pounds of coal consumed 72,223,992 foot pounds. Duty of engine alone per 800 pounds of steam used, crediting engine with work done by feed-pump and with heat imparted to feed water by condenser, 94,263,536 foot pounds. Revolutions during test, 85,249. Gallons pumped (computed by displacement), 50,711,220. Resulting per cent. of slip, 1.84. Average capacity per 24 hours, 11,365,628 gallons. Actual evaporation per pound of coal from feed at 50 degrees F. to steam at 80 pounds pressure 6.55 pounds. Equivalent evaporation per pound combustible from and at 212 degrees F. 9.31 pounds.

The paper was discussed by Messrs. A. V. Gude, of Atlanta, W. F. Foster, James Geddes, W. L. Dudley and Olin H. Landreth, of Nashville.

The discussion developed the fact that the leakage of the reservoir and force main about four miles in length amounted, when reservoir was full or 31 feet deep, to 507,400 gallons per twenty-four hours, and when the water in reservoir was only one foot deep the leakage of reservoir and main amounted to 197,600 gallons per twenty-four hours.

showing that the leakage of reservoir alone was about 300,000 gallons per twenty-four hours, as the variation in pressure and hence in leakage in main due to the thirty feet difference in head was quite small, since the greater portion of the length of main is under a head of over 200 feet. The reservoir is composed of solid rubble masonry walls from 32 feet to 36 feet high, 8 feet thick at top, and about 26 feet at bottom, curved in profile with concrete core throughout the full height, and was built after plans of City Engineer Jowett, and of stone taken from the reservoir site.

The programme of the evening was closed by Mr. Landreth, who exhibited and explained the working of a binocular hand-level recently put on the market by a leading firm of instrument makers. The accuracy of work done with the instrument was stated to be absolutely dependent on a perfectly balanced condition of the vertical muscles moving the two eyeballs of an observer, a condition, oculists state, that very rarely exists. Mr. Landreth presented, in support of his theoretical objections, the result of a series of experiments with nine engineering students accustomed to precise instrumental work, but selected at random and without any knowledge of the condition of their eyes. The mean of three settings by each student of a target at 500 feet distance, with the instrument on a firm support, gave a maximum difference among any two of the nine observers of 2.16 feet and a mean error for the nine observers of .49 feet, while corresponding settings with a Locke hand level of two settings by each student—the instrument being similarly supported—gave a maximum difference of only 0.6 feet between any two observers and a mean error of .17 feet, showing the ordinary Locke level to be subject to about one-third the error of the binocular form.

INDUSTRIAL NOTES.

Two additional metal zinc furnaces have been started at Friedensville, Pa.

The Litofuge Manufacturing Company has moved into commodious quarters at No. 62 John street, New York.

The Spiegel Furnace of the Lehigh Zinc and Iron Company, South Bethlehem, Pa., is running full time. The company proposes to erect a new and larger furnace in the near future.

The Allentown Iron Works, Allentown, Pa., are daily receiving large consignments of foreign iron ore shipped there from Port Richmond, Philadelphia. The works are at present in full blast.

T. W. Harvey, G. L. Harvey and A. M. Turner, of Chicago, Ill., have incorporated the Harvey Steel Car Company, with capital stock of \$1,000,000. The company will deal in railway cars and supplies.

The works at the Standard and Venture powder and dynamite manufactories, situated near Brockville, Ont., exploded on the 11th inst. Where the works stood is a hole in which a good-sized house could be placed out of sight. The loss is estimated at \$10,000.

The standard Steel Casting Company is making large additions to its plant at Thurlow, Pa. The new buildings will consist of one 280x100 feet, which will be used for molding and drying castings, a new storage house 100x80 feet and a gray iron foundry 100x60.

The old Excelsior charcoal iron furnace, at Ishpeming, Mich., of the Carp River Iron Company, Marquette, Mich., is being repaired, and, it is said, will be again put in operation. The furnace was built in 1872 and rebuilt in 1879, but has been idle for several years.

The City of Havana, Cuba, now has an electric light plant consisting of 4,500 incandescent lamps and 600 arc, with four 150 horse-power boilers. The whole is under the superintendence of Mr. Wilfrid H. Fleming, Member of the Institute of Electrical Engineers.

A four-inch gun was successfully cast on the 10th inst., by the Carpenter Steel Company, Reading, Pa., which received an order from the United States Government for 35 steel cannon of various sizes, as mentioned in our "Contracting Notes" of last week. The cannon will be forged and completed at the Washington Navy Yard.

The shops of the Dickson Works at Scranton, Pa., are being enlarged by the building of an extensive brass and foundry department, while the old foundry is being raised to the height of three stories. Three new cranes, two of 20-ton and the other of 35-ton capacity, now being constructed in this city, will be placed in these buildings.

The Vulcan Iron Works, at Wilkesbarre, Pa., have on hand now one of the largest pairs of first motive hoisting engines ever made. They are for the Delaware & Hudson Coal Company, and will be used at the Conyngham mine, at Wilkesbarre. They are 600-H. P. and with an 18-foot drum will hoist a carriage up a 600-foot shaft in 12 seconds.

Three thousand employes of the National Tube Works Company, at McKeesport, Pa., struck on the 12th inst. for a 10 per cent. advance in wages. All departments closed down except the

puddling and rolling mills. The employes in these departments are members of the Amalgamated Association, and have no grievance, but if the matter is not settled, they will also be forced to quit work in a few days.

The Wisconsin Iron Company, of Chippewa Falls, Wis., has filed a mortgage given to the Massachusetts Loan and Trust Company, amounting to \$1,500,000; it covers 5,336 acres in Ashland County, 206 acres in Chippewa, 4,991 in St. Croix, 9,384 in Pierce and 13,320 in Taylor; the right of way through St. Croix County, together with land in Pierce and Dunn counties, and the minerals and saw-mills on these lands.

The Hendey & Meyer Engineering Co., of Denver, Colo., has just completed a fly wheel for a Corliss engine for the Hallock Lumber Mfg. Co., which is the heaviest casting ever made west of the Mississippi. It is 14 feet diameter by 31 inches face, and weighs 22,000 pounds. They showed your correspondent letters they had received from Utah, Washington, D. C., South Africa, England and New Zealand, in answer to their advertisement in the JOURNAL.

The first train to cross the Atlantic and Pacific cantilever bridge at Needles, Cal., passed over at 2 o'clock on the afternoon of the 10th inst., allowing travel to be resumed after thirty hours' interruption caused by a washout. The bridge is 980 feet long, the span 660 feet between the main piers, the longest span of that type in America. Five passenger trains held on each side of the river by the washout proceeded at 3 o'clock. The formal opening of the bridge will probably occur on May 20th.

The Cartwright smelter is an invention of a Wilber, Neb., citizen, whose name it bears. The smelter, it is claimed, can treat refractory ores cheaply and has recently been tested; no results, however, have been published. A stock company has been organized, with capital stock of \$1,000,000. The officers are: J. A. Paddock, president; J. W. Wenn, secretary; W. H. Mann, treasurer. Captain B. W. Davis, general manager of the Consolidated Nebraska Mining Company's mine at Pinos Altos, New Mexico, has secured the right to put up and operate the first smelter.

The California Iron and Steel Company, San Francisco, Cal., has issued bonds to the amount of \$100,000, the bonds to be used to settle the debts and liabilities and to be secured by a mortgage upon all the real estate of the company. The old bondholders will get \$72,000, they relinquishing the original issue of \$150,000, with all accrued interest, and paying all back taxes and a note of \$51,000, which was sued for by the First National Bank. The balance of the issue, amounting to about \$18,000, will clear up all outstanding indebtedness and leave the property, which is valued at about \$350,000, free. This ends several years' litigation.

The Aluminum Brass and Bronze Company, Bridgeport, Conn., where the main office and rolling mills are located, has just completed one of the finest rolling mills in this country for the production of high-grade metals in sheets, rods and wire. This company manufactures the Cowles' aluminum and silicon copper alloys in various forms. It also manufactures a full line of sheet copper, sheet brass, copper bottoms, soldering coppers, German silver, brass and copper wire, and all other goods that are now made by the brass and copper manufacturers. In addition to this, the company has connected with its rolling mills a large foundry, in which it makes castings of the various aluminum and silicon alloys, also staple brass and bronze castings. The new metals have great tensile strength and non-corrosive qualities.

The injurious effect of the Canadian tariff on American trade is daily evidenced by individual transactions, though from the Canadian point of view, it is "protection which does not protect." A New York firm manufacturing and dealing in apparatus for producing oil-gas, sold a plant this week to a Canadian firm. Its cost was \$1,000, and the duty amounted to \$300. As no such apparatus is made in Canada and the Canadians are beginning to favor the use of oil-gas as fuel in many branches of industry, they commence to realize that the prohibitive tariff is actually a detriment to them rather than a protection. They want the superior machinery of the United States, but they do not want to have to pay \$300 more on a thousand dollar machine than is paid in this country. And it is hardly to be expected that American manufacturers will sacrifice that sum in such a transaction.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services. We also offer our services to foreign correspond-

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

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

GOODS WANTED AT HOME.

815. Engine and boiler of sufficient capacity to run an Edison incandescent electric plant of 300 lights. Quote prices delivered in Georgia.

816. Complete outfit for canning factory. South Carolina.

817. Heating apparatus for hotel of 40 rooms. Tennessee.

818. Estimates on good, light, second-hand dummy engine, rails, etc., for a short tram road. Tennessee.

819. Addresses of manufacturers of wire machinery.

820. Canning factory outfit with a capacity sufficient to make 2,000 and 3,000 cans per day. North Carolina.

821. Iron safe and elevator for furniture factory and variety works. Alabama.

822. Sugar evaporator with a capacity of 20,000 pounds per day, to be run in connection with a canning factory. Texas.

823. 80-H. P. engine and boiler for furniture factory. Georgia.

824. Complete outfit for weekly newspaper and job offices, with cylinder press, engine, etc. Virginia.

825. Hoisting, boring, and all other machinery necessary for a coal mine, the product of which will be from 1,000 to 1,500 tons per day from three shafts. Virginia.

826. A heavy milling machine and steam hammer. Georgia.

827. Electric plant. North Carolina.

828. Four, six, and eight-inch cast-iron pipe to stand 300 pounds hydrostatic power. West Virginia.

829. Pig lead for 2,000 feet of piping. West Virginia.

830. 40 H. P. cut-off engine and 50 H. P. boiler, complete, with all fixtures. South Carolina.

831. Complete brick outfit. South Carolina.

832. Corrugated iron roofing and siding for factory building. South Carolina.

833. Everything necessary to install 30 miles street railway from horse and steam to electric power. Alabama.

834. Wood-working machinery.—Sawmill outfit to cut 20,000 feet per day, shingle mill to cut 40,000 shingles per day and power to operate. Also feed rip saw. Georgia.

835. Machinery to manufacture ax handles and spokes. Alabama.

836. Addresses of iron ore washing machinery. Maryland.

837. Electric lamps for coal mines. New York.

839. Hoisting engine, double drum, link motion, about 40 H. P. New York.

840. A brick press that will make brick direct from the bank ready to go at once to the kiln. If such a press can be purchased, will also want two drying pans, 7 to 8 feet in diameter, elevator, engine, boiler, drum and steel wire rope for incline, together with all the appurtenances needed in an entire new brick plant. Kentucky.

841. Two hand elevators—one for freight and one for passengers. Tennessee.

842. A hand-power brick press and pug mill. Texas.

843. Pipe and power to raise water for 40 families from side to top of mountain. Distance from water to tank on mountain, 1,500 feet; perpendicular distance from water to tank, 175 feet. South Carolina.

844. Estimates on electric light machinery.

845. Complete plant for making brick. Georgia.

846. Quotations on a set of machinery for fluting and repairing "fluted rolls" for cotton machinery, excepting picker-rolls. Massachusetts.

AMERICAN GOODS WANTED ABROAD.

838. Addresses of manufacturers of steam plows. Cuba.

847. Prices of sugar machinery, coffee hullers, cleaners, polisbers and street sprinklers. Venezuela.

GENERAL MINING NEWS.

VIRGINIA, TENNESSEE AND CAROLINA STEEL AND IRON COMPANY.—President F. W. Huldecker, of this company has issued the first printed annual report, bearing date May 1, 1890. The receipts of the company to May 1 this year include \$2,085,658 from the sale of stock, \$1,030,000 from the sale of bonds, and various small amounts, making total receipts of \$3,115,658. The payments have been the same, less \$1,967 cash on hand, and they include purchases of land, advances to Bailey

Construction Company, etc. The assets and liabilities May 1 were:

ASSETS.	
Land in Virginia, Tennessee and North Carolina, estimated acres.....	\$212,000
South Atlantic & Ohio R. R. stock.....	1,086,000
Big Stone Gap Imp. Co. stock.....	731,149
Bristol Land Co. stock.....	450,000
Clinchport Imp. Co. stock.....	25,000
Block Mt. Coal & Iron Co. stock.....	10,000
South Atl. & Ohio R. R. Tenn. div. stock.....	4,000
Bristol Iron & Steel Co. stock.....	2,500
Equipment trust certificates.....	95,009
South Atlantic & Ohio R. R. bonds.....	1,830,000
Big Stone Gap Imp. Co. bonds.....	259,583
Bristol Land Co. bonds.....	300,000
City of Bristol bonds, contingent.....	50,000
Collateral trust bonds unsold.....	270,000
Bills receivable.....	89,841
Uncollected dividend.....	5,759
Land notes.....	3,990
Total.....	\$5,213,424

LIABILITIES.	
Outstanding bonds.....	\$1,309,000
Deferred land payments.....	120,000
Bills payable.....	43,711
Total.....	\$1,472,711

The report contains a history of the development of the company. The report says the company is at present without a stated income, but with the increasing demand for mineral, timber and other lands, royalties from coal lands and earnings on the railroad, the management feels confident of a future success.

CALIFORNIA.

AMADOR COUNTY.

PIONEER MINING COMPANY.—It is said that this company has been rehabilitated. Several meetings of the stockholders have been held to that end. The following have been elected trustees for the ensuing year: W. F. Detert, president; Frank Hoffmann, vice-president and treasurer; Mrs. Kate Langhorst, E. C. Farnsworth, secretary. The company owns the claim adjoining the Kennedy on the south. The reorganization is accomplished with a view to place the company in a position to sell should a favorable offer be received. It is reported that the Kennedy Company has offered to bond the property for \$50,000, paying \$5,000 down.

PLACER COUNTY.

(From an Occasional Correspondent.)

AUBURN, May 5. Quartz mining in the vicinity of Auburn, is experiencing quite a revival. The district has in former years produced much gold and it now bids fair to come into prominence again. In the last few years by far the largest proportion of the output of Placer County has been derived from the drift mines of Forest Hill Divide.

The principal goldbearing zone at Auburn is located along a contact of granite with amphibolitic schists and continues for a distance of about five or six miles from Auburn Ravine in a W. N. W. direction. In this zone, both in the schist and in the granite, but mostly in the latter, there are numerous quartz-veins nearly all striking E. to W. or W. N. W., and dipping W. at differing angles, usually about 45 degrees. The width varies from a few inches to several feet. In the upper levels there is much free gold, but, as usual, in sinking more sulphurets (galena, blende, pyrites) appear.

The abundant water supply this winter has enabled the pocket-miner to pursue his vocation with good success among the many small quartz veins in the belt of greenstone slates east and north of Auburn. Altogether, it is probable that the gold production of California will be considerably increased this year.

ALMOND.—Near the Belmont mine, the hoisting works of which burned two years ago, Mr. B. F. Hartley is prospecting an extension of that property, called the Almond mine.

CRATER.—At Doty's Flat, 1½ miles further W. N. W., the Gold Blossom is again being worked, and it is said that active operation will shortly be begun on the old Crater mine.

ECLIPSE.—This mine is located about half a mile further west. As well as the former, it is in granite and near the contact. A New York company, with Mr. J. B. Patterson as superintendent, has begun active operations on this old property, and last winter erected a ten-stamp mill, with amalgamating plates, and two Frue vanners. The stamps weigh 800 pounds each, and crush through a 40 mesh screen. A Pelton wheel furnishes the motive power to this substantial and well-built gold mill. The buildings contains room enough for ten stamps more, should such an addition prove necessary.

HATHAWAY.—Near Ophir, south of Auburn Ravine, in the granite area, is this mine, which is being actively and successfully operated, with Mr. G. F. Taylor as superintendent. A twenty-stamp mill with vanners to save the sulphurets has been erected and is running day and night. The mill crushes 40 tons a day, and the ore is said to average \$8 to \$10 per ton. About 1,500 pounds of sulphurets, said to assay \$150 to \$200 per ton, are collected per day, besides the free gold caught on the plates. The vein is from 2 to 3 feet wide.

MOORE.—White Bros. & Sharp are working this mine, about two miles west of Auburn, on a small scale, but, it is said, very successfully; much of the gold is coarse and can be separated by hand in

mortar; milling ore has been treated in the 5-stamp Pelster Custom mill, situated near the mine.

(From our Special Correspondent)

SAN DIEGO COUNTY.

Recent reports from the Cargo Muchacho mine, located in this county, about 28 miles from Yuma, are more encouraging than formerly. A large amount of rock was shipped from this mine to the station at Ogilby, six miles distant on the Southern Pacific Railroad, and thence to El Rio, on the Colorado River, at a cost of \$2.50 per ton. This was some time ago, but last year Mr. Blasdel, of the Paymaster mine, moved the mill from the former property to the Cargo Muchacho, and built a pipe line fourteen miles long from the Colorado river to the mill. As the results were of an encouraging nature, on testing this somewhat experimental scheme, five stamps were added and the construction of a second pipe line was commenced. Both lines are now completed and in operation, furnishing sufficient water, not only for the Cargo Muchacho mill but for another like it. Quite recently Mr. Blasdel has added five more stamps to the mill, and he now has a good 20 stamp gold mill in operation. The Cargo Muchacho mine, like many individuals, has had varied fortunes, but it now seems to be in good hands, and may become a dividend payer.

The Pasadena mine is located about one mile due north of the Cargo Muchacho, seeming to be an extension of the latter, or, at any rate, situated along the line of the same great fault plane. The two veins are very similar in character, both furnishing a hackly white, meager quartz rock carrying free gold. Mr. Blasdel has offered to supply the necessary water for a ten or a twenty stamp mill to the owners of the Pasadena mine, and it may be that the latter company will build a mill, as its property is one of considerable promise, though it could not afford the high rental of a custom mill, and the heavy expense of wagon and railroad transportation. Having its own mill will reduce expenses about \$3 per ton, which is a considerable item on \$12 rock. The mines of this district have suffered from poor management; lack of capital; great distance from water, and the numerous failures of the district. In the early history of this section the Padre y Madre mine produced a large amount of gold, it is said, at a profit. This mine is located west of the Pasadena mine at least a mile, in the low, gently rolling foot hills of the range. It looks as though with proper methods of mining and cheap facilities for transportation and milling this property might again become a bullion producer. The Cargo Muchacho district possesses many interesting features, of which I may have more to say in the future.

COLORADO.

The mineral palace now erecting at Pueblo will cost about \$250,000. It will be of handsome design, the exterior being a series of square columns and beautifully polished stone. The carving will be ornate. All parts of the building will be made of the products of Colorado's mines, the owners in all the counties in the State having sent in their choicest and richest specimens. In the interior will be seen every variety of mineral production, from stone and coal to pure gold, the value of which will be at least \$750,000. It is intended to be a permanent exhibit, open every day the year round, and its originators desire to have the choicest specimens of mineral wealth from every State in the Union represented side by side with the resources of Colorado. Building stone, granite and marble are also desired. The building will be lighted by 3,000 incandescent electric lights. It is the intention to reproduce this in duplicate of design and brilliancy of decoration and display, but somewhat reduced in size, as the Colorado mineral exhibit for the World's Fair in Chicago in 1892.

The Denver & Rio Grande Railroad intends, it is reported, to complete its tunnel through the main range of the Rocky mountains at Tennessee Pass, for running trains in July next. The Colorado Midland Railroad is about to commence running another through the same range about ten miles south, which will take about two years to complete. It will be about a mile and three-quarters long (9,350 feet) and 1,000 feet below the top of the range, probably avoiding snow blockades and heavy expenses involved in overcoming the greater elevation. Some air lines from Denver to Grand Junction to be built in the future—perhaps by the Denver, Colorado Canon & Pacific line—will greatly reduce altitudes and heavy grades by abundant tunneling. The Midland tunnel is expected to cost \$1,000,000.

GILPIN COUNTY.

The case of Williams & Randall against T. M. Walker for \$15,000 is now on trial. The complaint alleges that the plaintiffs sold to the defendant a one-fourth interest in the Lutz mine, in Gilpin county, for \$15,000, and that defendant has not yet paid for the same. In answer to the complaint the defendant says that he was induced to negotiate for the property by the false and fraudulent representations of the plaintiff.

BATES-HUNTER MINING COMPANY.—The official report for April shows that the water has been lowered 82 feet, 3 inches. The company is now down 391 feet with the water from the surface about midway between third and fourth levels

On March 25th a contract was let to drive a cross-cut tunnel from Daly lots to the vein, thence along the vein to Bates-Hunter shaft, about 225 feet, at \$3.50 per foot. Since then the contractors, two men, have driven 52 feet. The distance yet to drive to cut the vein is about 23 feet. Level will strike the shaft at depth of about 50 feet. It is the intention to run the water through the level, thus saving 50 feet of a water lift permanently, which will mean a considerable saving in fuel each month. A great many tributaries are at work.

(From our Special Correspondent.)

PITKIN COUNTY.

COWENHOVEN MOUNTAIN AND DRAINAGE TUNNEL COMPANY.—The recent progress in the drainage tunnel of the above company no doubt will be of some interest to your readers, as it is, so far as I am aware at least, the best progress on record in such work, viz., 611½ feet in two calendar months—61 days.

The tunnel has a width of seven feet six inches clear on the sills, six feet clear under the caps, and a height of six feet six inches clear above sills. Under the sills is the drainage trough 14 inches deep and 16 inches wide.

The work of driving was, in detail, as follows, by weeks, the number of shifts work in the face being given:

March 1-8.....	23	8-hour shifts	74 ft.
" 9-15.....	20	"	76 "
" 16-22.....	14	"	53 " 6 in.
" 23-29.....	21	"	87 "
" 30-31.....	6	"	19 " 6 in.
April 1-7.....	19	"	80 "
" 8-14.....	20	"	76 "
" 15-21.....	20	"	65 "
" 22-30.....	27	"	80 " 4 in.

The timbering, putting in of drainage box, and double track was carried ahead steadily, and the 611 ft. made complete within the two months.

MONTE CRISTO MINING COMPANY.—Colonel Morgan, manager of this company, states that he has made a contract with Hillery & Thomas to bring down from 10 to 20 tons of ore per day from the property. The mine is now said to show a solid breast of ore seven feet thick. The ore also carries considerable iron and is declared to be a good fluxing ore. This mineral was opened in drifting from the old Lake tunnel, and the discovery seems to bear out the theory that the contact there rapidly increases in value as it dips into the earth.

IDAHO.

KOOTENAI COUNTY.

NORTH IDAHO MINING COMPANY.—This company was incorporated recently. The incorporators are John McCormick, D. S. Corbin and J. W. Allen, who are also the directors. The capital stock of the company is placed at \$500,000, shares of \$5 each. For the present the headquarters of the company will be at Spokane Falls, but as soon as the Northern Pacific & Missoula road reaches the country where are situated the mines of the company, the main office will be removed to Missoula.

WASHINGTON COUNTY.

There is quite an influx of miners and prospectors going to the Seven Devils mining district. The chief mines of the district are copper, and the ores are denominated peacock ores from being of a peacock-blue color. They also carry silver and gold in combination with copper. One of the best mines in the district is the Peacock mine, which, it is stated, has a large body of copper ore uncovered by the action of the water from a small stream directed on it. The lowest newspaper estimate of the ore uncovered is 75,000 tons, of which 30,000 tons will yield 40 per cent. of copper, and 45,000 tons 25 per cent., which equals 52,000,000 pounds of copper, and, valued at 10 cents per pound, would yield a production of \$5,200,000.

There are at present, according to Mr. Levi Allen's report to the Boise City board of trade, but about 115 locations. The principal groups of mines are first the Peacock, consisting of the old Peacock mine, the Confidence, Bodie, Standard, South Peacock and Copper Key. This is the most important group, being near the steamboat landing (four miles), and containing large deposits of copper ore exposed on the surface.

MICHIGAN.

HOUGHTON MINERAL LAND AND MINING COMPANY.—The controlling interest in this company's stock is now in new hands, and the offices of the corporation have been removed from New York and Houghton to Sharon, Pa., and Iron Mountain, Mich. The new directors are: Geo. W. Johnson, New Castle, Pa.; P. L. Kimberly and R. Williamson, Sharon, Pa.; John T. Jones, Iron Mountain, Mich., and J. R. Devereaux, Marquette, Mich. Geo. W. Johnson is president; R. Williamson, secretary and treasurer and John T. Jones, General Manager. All matters relating to the N. ½ of Sec. 30, 40, 30, adjoining the Cnapin and Hamilton mines, and owned by this company, are now referred to the Iron Mountain office for consideration.

COPPER MINES.

KEARSARGE MINING COMPANY.—The report that this mine has struck the Calumet & Hecla conglomerate is said to have been but a rumor. The company will delve for it, encouraged by the development in the Centennial mine to believe that similar rock will be found within its own

boundaries. Meanwhile the eleventh level, second shaft, of the Kearsarge has revealed good-looking ore. Unless the money is wanted for the conglomerate search or a stamp mill, Kearsarge may pay another dividend in July. Its rock is now stamped at the Tamarack mill, temporarily idle on account of the recent fire.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, May 5.

(This letter was crowded out last week.)

The weather was very favorable for mining operations during the week ending May 3d, and the output was almost up to the standard. Zinc ore slightly advanced in price as did also lead. Prospectors are busy in all the camps and many new strikes have been made on entire undeveloped tracts of land. The outlook is certainly very encouraging. The following is the reported sales of ore for week ending May 3d: Joplin mine, 1,242,812 pounds zinc ore and 108,898 lead; value, \$18,012. Webb City mines, 1,304,730 pounds zinc ore and 22,000 lead; value, \$16,795. Carterville mines, 778,820 pounds zinc ore and 36,194 lead; value, \$10,535. Zincite mines, 277,610 pounds zinc ore and 9,087 lead; value, \$3,664.

Oronogo mines, 87,340 pounds zinc ore and 22,310 lead; value, \$1,582. Galena, Kan., mines, 800,000 pounds zinc ore and 225,000 lead; value, \$14,662.

All districts, total sales, \$65,250. The Standard Lead and Zinc Company, of Belleville, was compelled to hold over 30,000 pounds zinc ore last week on account of being unable to secure cars for shipment.

Hoovar & Co. and the Zincite Company, on the Standard land, are still sinking in good bodies of ore.

The old mines at Sherwood, recently taken hold of by St. Louis parties, now have the water fully under control and ore is being taken out. These mines were great producers in the early history of zinc mining, but as depth was gained the small pumps then in use could not cope with the water.

Dr. A. J. King and others, of St. Louis, have opened up a fine body of zinc ore on Silver Creek. We are pleased to see the Doctor rewarded at last for his labor; he has prospected this land for the past three years.

Mr. Carl Henrich, Superintendent of the Victor mines, south of Webb City, owned by G. B. Young and others, was in the city Saturday, and reports the mine in fine condition. The new working shaft is being sunk as fast as possible and will soon cut the ore body. The output of this property for the week ending May 3d was 116,200 pounds zinc ore.

Mr. Henry Wymann, one of the heavy ore buyers and mine operators of Joplin, is preparing for a trip to Europe with his family.

Eighty acres of the famous old Paxton land have been plotted off into town lots, the dumps leveled down and shafts filled up.

Chas. Mott & Co. are having 320 acres plotted off in East Joplin.

The Joplin Business Men's Club held a very important meeting last Wednesday evening, at which it was decided to build a \$40,000 club and opera house on two lots on the southwest corner of Joplin and Fourth streets. The club has been doing good work for the best interests of the city.

The effects of Jay Gould's visit to this city are already felt.

The chief engineer of the Missouri Pacific Railroad was here during the past week, securing the right of way so as to extend the line to Minden, Mo.; this will bring us in direct connection with the great coal fields of Martin County. George H. Nettleton, president of the Kansas City & Memphis Railroad, will arrive in the city tomorrow morning with a party of capitalists to look over the mining interests and see what is required by way of railroad facilities from his line.

The lead and zinc mining interests of southwest Missouri and southeastern Kansas that so long were lying dormant are within the past year attracting the attention of the mining investors almost from the Atlantic to the Pacific. The city is filled with strangers all the time, and the lobby of the Joplin Hotel reminds your correspondent of the old Clarendon Hotel of Leadville in 1879 and 1880. The reader must not infer that the district is having a mining or real estate boom, for such is not the case. But the true merits of the lead and zinc mines are now investigated by men of capital, and when it is found that as a rule the almost wonderful yield is produced by the most primitive and crude appliances without the aid of capital, then it is easy to determine what can be done by the investment of capital and the use of improved machinery.

JOPLIN, May 12.

The output of lead and zinc ore of the entire district for the week ending May 10th was quite large. The weather was fine and the miners were enabled to put in full time. The ore market continues with an upward tendency. Zinc ore is in good demand with all the ore buyers. The following are the sales for the week ending May 10th.

Joplin mines, 1,162,656 pounds zinc ore and 134,280 lead; value, \$1,777.

Webb City mines, 1,187,050 pounds zinc ore and 75,745 lead; value, \$16,802.

Carterville mines, 482,680 pounds zinc ore and 25,570 lead; value, \$6,772.

Zincite mines, 211,530 pounds zinc ore; value, \$2,691.

Oronogo mines, 45,300 pounds zinc ore and 7,330 lead; value, \$728.

Galena, Kan., mines, 1,760,112 pounds zinc ore and 127,950 lead; value, \$20,416.

All districts, total value, \$35,183.

The most important transaction of the week was the sale of 240 acres of mineral land for \$30,000, located south of the Empire mines, to L. C. Dunham, C. C. O'Fallon and Sewell. Messrs. Dunham and O'Fallon are the principal owners of the American Nettie gold mine at Ouray, Colo. The purchasers have made preparations to begin prospecting and development work at once according to the most improved methods.

The purchasers of the magnificent Grand Falls water power have already commenced the preliminary work of increasing the power and will soon be furnishing electric power for operating the mines. This will be a boon to miners of small capital.

MONTANA.

HELENA & LIVINGSTON SMELTING COMPANY.—These works, situated at East Helena, have, after repeatedly reducing their output, finally closed down, and also the smelters at Great Falls. There is a rumor that the closing is a preliminary step towards a combination of the two.

NEVADA.

WHITE PINE COUNTY.

OSCEOLA GRAVEL MINING COMPANY.—The latest news from this company is that the West Ditch is now delivering 1,000 miner's inches, and that hydraulic mining is going on night and day. This is an increase of 700 inches since the last report.

NORTH CAROLINA.

CALDWELL COUNTY.

BEE MOUNTAIN COMPANY.—This company, of Morgantown, is now placing on its mine the Wisconsin electric mill.

(From our Special Correspondent.)

DAVIDSON COUNTY.

NORTH CAROLINA SMELTING WORKS.—A charter has just been granted to this company, which was organized for the purpose of treating refractory ores, especially those of the Silver Valley Mine. The works are located at Thomasville, and utilize the old Piedmont reduction plant, with such changes as are necessary for the new process; the treatment of the ordinary sulphuret ores is to be the same as that practised in the West, but the new process referred to is for the reduction of the zinc-silver bearing ores. As for the details of this process, they are not yet ready to be made public, though the officers of the works courteously showed the JOURNAL correspondent through the building and explained the different steps. They seem plausible enough, if it can be done with a profit.

GASTON COUNTY.

Maj. Lawton and John H. Furman, of Georgia, sailed for Europe on the 7th inst. in the interest of deposits of tin in this section; they carry with them a lot of fine specimens and options on several thousand acres of tin bearing land. Recently a specimen of this ore was given to me which is extremely rich; the only question in my mind is as to the existence of this ore in quantity; at any rate there is no doubt about one thing, and that is that these deposits deserve a thorough investigation.

PENNSYLVANIA.

COAL.

The Mount Carmel shaft colliery, at Mount Carmel, after an idleness of 13 weeks, resumed operations on the 12th inst.

LEHIGH AND WILKESBARRE COAL COMPANY.—An extensive cave-in occurred in the Hanover mine of this company, at A-shley, three miles from Wilkesbarre, at 9 o'clock on the morning of the 15th inst., by which twenty-seven men were entombed. That portion of the mine in which the men were is known as No. 4 slope, and the cave-in if it did not overwhelm them at once, shut off all means of reaching the surface. Rescuing parties were at once organized and an opening broken through into a man way along the bed of a mountain stream where the chambers in that part of the mine came within a few feet of the surface.

Gang after gang relieved one another until at 5 o'clock the news was passed that they had succeeded in breaking through the chambers beneath the cave. The men toiled on in silence until 6.30, when there was a commotion at the mouth of the dark opening, and the foreman crawled out on his hands and knees, and announced that they had found one of the victims. He was lying at the bottom of a fifty-foot plane, and in order to rescue him it became necessary to lower a miner down with a rope. This was done, and the first of the victims was hoisted to the surface. He was still alive, but his injuries are considered fatal. It is supposed that he wandered away from the rest of the men, and in his efforts to find a way out fired the gas in an old chamber. If this explosion reached the other men their chances of escape are very slight. Nearly a score of houses are shattered and destroyed, and the families were compelled to flee for their lives. The latest report

from the scene of the disaster, at 8 o'clock, is to the effect that the rescuing party has penetrated to within sight of two dead bodies, but the gas is so thick that they were driven back to the surface. The place is full of black damp, and further approach in the direction of the victims is impossible, even with safety lamps. As it looks now, very little hope is entertained that any of the men will be rescued alive. The latest reports received as we go to press show that so far 19 bodies have been recovered. It is now said that Fire Boss Allen caused the explosion. A slight cave had stopped the air current. Allen appeared with a naked light. The miners who were cleaning the debris expostulated in vain. Soon after a violent explosion occurred. Allen, Frane and Roberts had started out and called upon the others to follow. The three got 500 feet away before the explosion came. They lay down flat upon their faces to escape after damp. The cave-in occurred in front, blocked the way, and their companions were separated from them by another fall. This accounts for the finding of these three first.

John Allen, the fire boss, died this morning in terrible agony.

ROCK HILL IRON AND COAL COMPANY.—The Supreme Court on the 12th inst. handed down an opinion upon the liability of proprietors of mines in the case of McDonald vs. The Rock Hill Iron and Coal Company. McDonald was struck on the head by a descending cage in one of the company's mines. The Huntingdon County Common Pleas Court decided in McDonald's favor in a suit brought by him. The Supreme Court reverses this decision on the ground that the defendant company's point of contributory negligence on the part of plaintiff, in failing to inquire if the cages were running, should have been affirmed, and the jury directed to find a verdict for the defendant.

OIL.

The Chief of the Bureau of Statistics reports the total value of the exports of mineral oils from the United States for the month of April, 1890, and during the ten months ending April 30, 1890, as compared with similar exports during the corresponding periods of the preceding year as follows: April, 1890, \$3,716,263; April, 1889, \$3,641,490; ten months ending April 30, 1890, \$42,047,325; ten months ending April 30, 1889, \$41,170,428.

Exports of refined, crude, and naphtha from the following ports, from January 1st to May 9th, were as follows:

	1890. Gals.	1889. Gals.
From Boston	902,114	1,099,711
Philadelphia	40,718,077	42,603,560
Baltimore	3,537,133	1,277,583
Perth Amboy	4,047,231	7,119,544
New York	127,859,553	137,154,295
Total	177,084,108	189,254,693

WEST VIRGINIA.

WOOD COUNTY.

Press dispatches state that the oil excitement in Parkersburg, to which we have referred in previous issues of the JOURNAL, continues, and it is reported that two new oil wells have been struck in the Eureka field. One of them is said to be a 500-barrel and the other a 600-barrel well. J. M. Clouston leased the most valuable tract 20 years ago and put down a number of wells that proved to be only dusts. After impoverishing himself, he abandoned the field, though he held on to his lease. When the recent development took place he thought the term of his lease had expired, but to satisfy himself he examined it and found it had one more year to run. He has brought suits to eject all the big operators, and the indications are that he will clear a considerable amount of money by resurrounding his lease.

FOREIGN MINING NEWS.

CANADA.

(From our Special Correspondent.)

PROVINCE OF NOVA SCOTIA.

GOLD.

Mining work at Malaga, in Queens County, continues brisk. The Parker & Douglas and the Malaga Mining Company are engaged in development work; the mill returns from the latter showing during the past two months 424 ounces from 400 tons of quartz.

At Cairboro, Halifax County, work is being continued in low grade ores. Mr. Touquoy passes the surface soil, carrying gold in quartz and some free gold, through his water stamp mill. The returns per ton are from 2 to 3 dwts., which yield a good profit, as the mill stands in the middle of the ground to be worked.

At Sheet Harbor, in the same county, it is expected that the Lochaber Gold Company will shortly put up a plant for treating by chlorination under pressure their gold ores. The gold in these leads runs high in the assay, but is fine and not suitable for treatment in stamp mills.

The well-known Rose and Albion leads at Montagu continue working steadily. The returns for March show 229 ounces from 137 tons, and for some time past these investments have been making satisfactory returns.

COAL.

The steamer "Eveline," which was to have

opened the St. Lawrence coal trade with a cargo from Cow Bay, got on the rocks, and is being repaired at the Halifax dry dock. The miners at Cow Point have returned to work, the management having abolished the weighing complained of, and it is expected that an advance in coal cutting rates will also be conceded.

PROVINCE OF ONTARIO.

PORT ARTHUR, May 12.
BADGER SILVER MINING COMPANY.—This company shipped \$10,000 worth of high-grade ore and concentrates on the 1st inst. The management has decided on a vigorous policy of development work this season. Two shifts are at work south of Badger Mountain, cross-cutting for the vein. When found, it is intended to sink and thoroughly explore the ground. Explorers are at work prospecting the whole of this company's property, and it is expected that the new work in conjunction with the energetic development work carried on at the old workings will make the Badger repeat its splendid output of 1888 and 1889.

BEAVER MINING AND MILLING COMPANY.—Sinking with the diamond drill at the junction of the Beaver and North Bluff veins, has been discontinued. Four holes were drilled to a depth of 128 feet. The first hole struck the vein 12 feet below the surface of the rock, which at that point is 60 feet below the surface. The developments made with the diamond drill have been so satisfactory that Captain Hooper did not deem it necessary to go any deeper with it at that point. He will at once commence sinking a shaft at the junction of the two veins, and put that part of the Beaver property under active development. Some of the cores brought to the surface by the diamond drill were literally full of sulphide of silver, the average going about 40 ounces. The mill is now in readiness and will be started in about one week, just as soon as the tramway from the mine can be put in shape. The mill will treat 25 tons per day, which, when the richness of the Beaver ore is considered, will run into large amounts per month. Capt. Hooper expects to double, and possibly treble, the capacity of the mill about the middle of summer. The shipment for May is now ready, and amounts to \$18,000.

EAGLE MINING COMPANY.—This company's property adjoins the Badger Mine on the south. It comprises about 300 acres, is well timbered, and has a good stream of water suitable for milling purposes. The owners, who are Milwaukee capitalists, intend to thoroughly prospect their property, on which two or three strong mineral bearing veins are known to exist. The locality is a good one, as not one single vein that has been developed in that group but has proven itself a bonanza. Notably: The Beaver, Badger, Elgin, Rabbit Mountain, Porcupine and Silver Creek veins; and now that railway facilities are assured, we may expect to see every location thoroughly prospected, and such highly thought of properties as the Champion, Silver Victoria, West Beaver and Big Bear, turn out just as rich in silver as their neighbors.

LAKE SUPERIOR QUEEN'S SILVER MINING COMPANY.—This company has been organized in London, England. Its object is to acquire and develop mining lands in the Thunder Bay (Port Arthur) district. Capital, \$4,175,000. John McDonald, of Winnipeg, is on the local board of management.

MURILLA MINING COMPANY.—Work has ceased for the present at this mine, owing to their pumping facilities not being equal to raising the water. A large plant is being procured, and as soon as it is in position work will be commenced again in the bottom of the mine. Their vein continued to improve. Assays from the bottom of the shaft gave 125 ozs. silver to the ton.

NORTH SHORE MINING COMPANY.—This company's property is situated in the township of McIntyre. They began operations in the summer of 1889. Work ceased about the end of the year owing to some legal difficulty between the owners. Everything has now been arranged satisfactorily and they began work again on the 1st inst.

STAR.—This property is reported to have changed hands at a handsome figure, and it is believed active and energetic mining will be carried on by the new owners. The vein is a strong one, well mineralized and has steadily improved as the depth increased.

MEXICO.
 CHIHUAHUA.

DON ENRIQUE MINING COMPANY.—Reports from this company, which recently had all its milling and hoisting machinery and supplies at Cushuirachic destroyed by fire, and to which we referred in our issue of April 5, state that that fire is still burning underground. Directors will endeavor to devise means, with stockholders' co-operation, to obtain capital to rebuild. A certain amount of work must be done yearly on each mine of the company to retain possession.

RUSSIA.

In Kuworag, the center of a district rich in iron ores, has just been erected the first blast furnace in Southwestern Russia.

With regard to the threatened exhaustion of the Baku petroleum wells, the English consul at Batoum, it is reported, is of the opinion that the fields show no signs of exhaustion. It is admitted by

the local well owners that within the limited area of oil-bearing territory which has been thoroughly explored it is now necessary to sink wells to a greater depth than heretofore to reach the strata which yield oil, but beyond this Mr. Peacock is not inclined to take an alarmist view. The total quantity of crude oil produced increased from 2,580,000 tons in 1888 to 3,306,000 tons last year, and there are many other petroleum fields along the Caspian as yet unexplored, which will probably prove productive as soon as an attempt to develop them is made.

SPAIN.

A cable despatch from Bilbao says that the strike of the 9,000 miners in that district is for an increase in their wages and a reduction in their working hours.

Mining riots are reported at Ortuella, Portugalete and Desierto. At the last-named place the miners stoned the troops, who fired in the air. The strikers continuing on the offensive, the soldiers sent a volley into the crowd, killing several and wounding others. Reinforcements of troops are arriving. The whole province of Biscay has been placed under martial law. Business is at a standstill and railway traffic is almost wholly suspended.

FINANCIAL STATEMENTS.

The following statement shows the financial balance of the principal mining companies, having offices in San Francisco, on May 1st, 1890.

May 1st.		May 1st	
Alpha.....		Kentuck.....	
Alta.....	\$26,389.00	Lady Washing- ton.....	16,764.00
Andes.....	4,431.00	Locomotive.....	835.00
Belle Isle.....	2,613.00	Mexican.....	4,232.00
Best & Belcher.....	1,333.00	Mono.....	10,330.00
Bodie.....	13,506.00	Morgan.....	1,682.00
Bulwer.....	9,450.00	Mou t Diablo.....	
Bullion.....	19,446.00	Navajo.....	
Challenge.....	6,781.00	Nevada Queen.....	
Commonwealth.....	51,927.00	North Belle Isle.....	
Con. Cal. & Va.....	\$134,758.00	N. Commonw'th Occidental.....	
Con. Imperial.....		Ophir.....	
Confidence.....	2,817.00	Overman.....	23,940.00
Con. New York.....	3,594.00	Peer.....	3,055.00
Crown Point.....		Peerless.....	
Chollar.....	20,654.00	Potosi.....	28,576.00
Crocker.....	2,396.00	Savage.....	2,224.00
Del Monte.....		Scorpion.....	5,573.00
Diana.....	3,139.00	Seg. B. & Mides.....	
East Sierra Ne- vada.....	5,006.00	Silver Hill.....	2,301.00
Exchequer.....	12,496.00	Silver King.....	2,822.00
Found Treasure.....	214.00	Sierra Nevada.....	13,813.00
Gould & Curry.....		Standard Con.....	
Grand Prize.....		Syndicate.....	4,650.00
Hale & Norcross.....	*b	Utah Con.....	17,363.00
Independence.....	1,738.00	Union Con.....	
Julia.....	7,202.00	Weldon.....	1,471.00
Justice.....			

* Indebtedness.
 a April shipments of bullion are to arrive, and the monthly expenses of the mine have not been paid yet.
 b And mine expenses for March unpaid; but there is \$34,515 due on the pending assessment, and the full bullion returns for April have not been received.
 c Not including bills receivable to the amount of \$277.

MEETINGS.

Mexican Bonanza Mining Company, at Room 5 No. 9 Geary street, San Francisco, Cal., May 17th, at 8 P. M.

DIVIDENDS.

Alabama Mineral Land Company, dividend of five per cent, payable June 2d, at the Continental National Bank, No. 5 Nassau street, New York. Transfer books close May 28th, and reopen June 3d.

Homestake Mining Company, dividend No. 142, of 10 cents per share, \$12,500, payable May 26th, at the office of Lounsbury & Co., Mills Building, New York. Transfer books close May 20th.

ASSESSMENTS.

COMPANY.	No.	When levied.	D't'nt in office.	Day of Sale.	Am't per share.
Acme, Cal.....	10	Mar. 20	May 15	June 9	.03
Alpha, Nev.....	4	Apr. 5	May 12	June 3	.25
Andes, Nev.....	36	Apr. 10	May 14	June 3	.25
Belcher, Nev.....	39	Apr. 29	June 3	June 24	.50
Con. Imperial, Nev.....	27	Apr. 16	May 22	June 11	.05
Del Monte, Nev.....	3	Apr. 16	May 22	June 13	.20
Gold Hill, Cal.....	9	Apr. 17	May 24	June 10	.25
Gould & Curry, Nev.....	64	Apr. 25	June 3	June 26	.30
Guasucaran & Cal., C. A.....	1	Apr. 2	June 3	June 24	10 00
Hale & Norcross, Nev.....	95	Apr. 9	May 14	June 5	.50
Hartford, Nev.....	7	Apr. 8	May 15	June 6	.02
Iron Hill, S. Dak.....	17	Apr. 19	May 21	June 7	.05
Morning Star, Ariz.....	1	Apr. 30	June 5	June 25	.02
Navajo.....	20	Apr. 8	May 15	June 6	.15
North B. Isle.....	17	Apr. 8	May 14	June 5	.20
N. Commonwealth, Nev.....	3	Apr. 16	May 21	June 12	.25
North Occidental.....	2	Mar. 31	May 5	May 26	.06
Occidental Con. Nev.....	6	Apr. 25	June 6	June 30	.25
Ophir.....	56	Apr. 2	May 6	May 26	.50
Peerless.....	14	Mar. 28	May 6	May 27	.10
Potosi, Cal.....	34	Mar. 27	Apr. 30	May 21	.50
Seabury-Calkins Con., S. Dak.....	12	Apr. 5	May 19	June 9	.00134
Seg. B. & Mides, Nev.....	6	May 5	June 9	June 30	.30
Sierra Iron, Cal.....	7	Apr. 17	May 29	June 23	1.75
Silver Hill, Nev.....	26	Apr. 14	May 20	June 11	.30
Standard Con., Cal.....	2	Mar. 4	Apr. 16	May 19	.25

MINING STOCKS.

For complete quotations of shares listed in New York Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 579 and 580.

NEW YORK, Friday Evening, May 16.

Railroad stocks continue extremely active at the Consolidated Stock and Petroleum Exchange, and mining shares are neglected.

The week has in no wise been different from what we have reported its predecessors. Quiet, and with no startling change. The approach of the warm weather has infused hope into mining men, who are once more at their old tricks, prophesying all sorts of activity and booms. They cite 1879 and 1880, and the boom that followed, as instances where the activity in railroad stocks was superseded by a good mining market. "History repeats itself," but sometimes it is rather slow in getting around. We would not have it said that our views are hopelessly gloomy. Far from it; and we should rejoice, with all friends of legitimate mining, to see the public once more show an interest in mining investments. How many people are there who have trunks full of worthless mining stocks? Their faith certainly has received a rude shock, and active indeed must be the market which will tempt these men to invest again. "A burnt child dreads the fire," and it is deeply to be regretted that the number of the burned is considerable, and these not only will not buy stocks themselves, but prevent their friends from investing in them. A fictitious "boom" in stocks which are apt to become worthless is to be guarded against, and we are pleased to note that a large number of dealers in mining stocks agree with us in this matter.

During the past week there has been some business, but the public entered very little into it. When railroad shares become too high-priced for the average investor, it may be that we shall see the latter devote his attention to mining stocks, in which case, in connection also with the Windom Bill, if it passes, greater activity is bound to follow. Copper stocks should now be very popular, for copper mines are paying well and are likely to increase their profits and keep them up for some time. A good market in order to be more than a passing spell of briskness, must be based on its real merit.

Application will be made to the Consolidated Stock and Petroleum Exchange to list the stock and bonds of the Ruby Silver Mining Company, of Grant County, New Mexico. The matter will come up before the Committee on Mining Securities on Tuesday of next week, but it will be some time before the committee will be ready to report.

Information concerning the newcomer is hard to obtain. In our mining news for April 20th, 1889, reference was made to this company. Will any of our readers who know the property or its history please give us some information concerning it?

The following is the nominating committee of the Consolidated Stock and Petroleum Exchange, who will nominate the officers and 21 members of the board of directory for the ensuing year: George R. Gibson, W. B. Smith, H. M. Cooke, John D. Lobb, C. H. Davis, W. E. Sperling, and E. Spencer. The re-election of Mr. Wilson as President is confidently expected by the majority of members. An independent ticket may be run with the success that usually attends it.

Minnesota Iron Company at \$31.25 shows one sale.

Bonanza King again appears with 300 shares at 18 cents.

Plymouth Consolidated has been one of the features of the week, having advanced from \$8 to \$8.75, with sales of 2,145 shares. This stock continues strong. We refer our readers to a letter in another column, and repeat our surprise that the officers of the company have no information to give to their stockholders. Their silence certainly lends strength to our correspondent's statement.

Brunswick Consolidated advanced during the week to \$2.15, but closed at \$2. Our remarks concerning this stock, which have been made for some weeks past, applies at the present time.

Quicksilver Preferred shows a solitary transaction at \$39, an advance of 50 cents. Common followed its last week's course, advancing to \$7.63, but closing at \$7.

Bodie Consolidated was neglected at .60@.62 cents.

Sutter Creek was stationary at \$1.60; Astoria at 4 cents continues to show large sales; this week 15,700 shares were disposed of.

El Cristo, the "puzzle" of the Exchange, is higher, and 1,400 shares at \$1.25 were sold.

Wall Street Mining and Milling Company's conspicuous for its absence. It probably has joined the silent majority, as no transactions have occurred for some time past.

The copper stocks show no sales this week.

Horn Silver continues one of the few really active stocks. An advancing tendency was noted during the week, and at the close \$3.15 was quoted. Sales aggregating 4,255 shares at \$2.85@3.15. Ontario closed at \$45.50 with 300 sold. Stormont, which was dealt in last week, has absented itself. Kingston & Pembroke reached 93 cents on Wednesday.

Caledonia shows sales of 3,600 at \$2@2.10, and has been steady during the week. Deadwood-Terra has been more active than for some weeks past; the sales amount to 1,100 at from \$1.45 to \$1.50. Homestake shows a few transactions at \$0.50.

Alice has been traded in to the extent of 2,600 shares at \$2.20@2.25, an advance of 10c. over last week. This stock appears to more be actively dealt in. Moulton was traded in at 50c.

Rappahannock shows an advance of one cent, selling at 6 cents.

Mutual Smelting and Mining Company recovered from last week's decline and was quoted at \$1.55@1.60.

In the Colorado stocks Little Chief is lower, at 33 cents. Freeland shows 100 shares at \$1.00. Chrysolite was quiet at 45 cents, an advance of 5 cents. Monitor was neglected at 3 cents; Lacrosse at 7 cents.

The only event of any interest in the Tuscarora is the stand taken by the New York stockholders. These, it is said, became disgusted with the way in which things were run, and decided to have something to say in the matter. Accordingly, a controlling interest was obtained by pooling all the stock held in this city, and at the election of the Commonwealth which took place on Wednesday not one of the old Board of Directors was re-elected. The new Board is: Messrs. Thomas Bell, P. C. Hyman, T. G. Pholby, Morris Hoeflich and Grayson, with Mr. Bell as president. It is stated that a transfer office will be opened in this city with Mr. E. R. Grant as transfer agent. A course similar to this will be followed in the election of the North Belle Isle, which occurs in June. The Tuscarora stocks remain neglected. North Belle Isle shows one transaction at \$1.35.

The San Francisco is announced slightly off to-day, and in our own market the Comstocks are all weaker. Consolidated California & Virginia continues in its declining career, closing at \$4.25. Crown Point was quiet at \$1.85@1.90, a decline of nearly a dollar. Gould & Curry closed at \$1.50. Savage was not dealt in. Sierra Nevada sold at \$1.80@1.75. Yellow Jacket quiet at \$2.10@2.20. Alta at \$1.20@1.25. Best & Belcher, \$3; Chollar, one transaction at \$2.70; Exchequer at 85 cents; Julia stationary at 41 cents; Mexican declined steadily during the week, and closed at \$2.75; Scorpion neglected at 40 cents. Union Consolidated shows one transaction at \$2.50. Utah closed at 75 cents; there were no transactions in the other stocks.

Comstock Tunnel stock sold at 15@18c.; 9,350 shares changed hands. The scrip shows one transaction at \$27.

Kossuth shows one sale at 13c.

Phoenix, of Arizona, continues the favorite, as may be seen from the sales, which aggregate this week 43,200 shares. It opened a little weaker than at the close of last week, at 93 cents, but steadily advanced till it close at 13.35.

We are assured that next week news which will prove of interest to the investing public as well as to the stockholders will be announced. The impression is universal that this stock will advance, and judging from the eagerness displayed by mining brokers to obtain shares, it does not seem improbable that it will do so.

To sum the market in a few words, the only noticeable stocks this week have been Phoenix, Plymouth, Horn Silver and Alice, the poor stocks being almost untouched.

Boston. May 15.

[From our Special Correspondent.]

Copper stocks have been the center of attraction the past week, and the market has been a very exciting one. Orders to buy have been hard to fill, and prices have advanced rapidly in consequence. The strength of ingot copper, and the general belief that high prices will prevail during the next twelve months, have stimulated buying, and the mines which have only a prospective value, but which afford large margins for profits, have been eagerly sought for. The orders have largely come from parties at the lake who are well posted in all that is going on there, and while some of the reports are doubtless sensational, there is every reason to believe that the famous Calumet & Hecla vein or lodes have been discovered in the adjoining territory of the Centennial and Kearsarge mines, and these stocks have been the leaders in the market the past week, although the whole list has been strong in sympathy with the leaders. Calumet & Hecla has gone beyond the point predicted for it, touching \$90, a gain of \$15 per share for the week.

Tamarack has been quite active, although not so much so as others, but shows a gain of \$5 for the week, selling at \$185. The reports from the mine are all favorable, and it is considered certain that unless something unforeseen happens the mine will make a grand showing before the end of the year and make satisfactory returns to its stockholders. Quincy has been quiet this week, and has not participated in the general rise, but shows a little weakness, with sales at \$96, a loss of \$3 1/2.

Boston & Montana advanced from \$50 1/2 to \$53, with a fair amount of activity.

Osecola sold up to \$38—an advance of \$3 1/2. This company hopes to get the Opeechee shaft running by July and to be able to stamp 20,000 tons of rock per day against 15,000 now. This will insure \$4 in dividends and a good surplus.

Franklin touched \$19 1/2 in the excitement, but did not hold, and declined to \$18 on moderate sales.

Atlantic has been in good demand, and advanced from \$19 1/2 to \$21 1/2, and held the advance.

Kearsarge and Centennial have both been very active and score the largest sales and advance of all on the list. The excitement to purchase these stocks was intense, reminding the old brokers of the exciting times of former years. The report from the Centennial that the Calumet conglomerate in this mine showed increasing width and richness with depth and drift, caused a rush for the stock, carrying the price up from \$34 to \$47.50, with heavy sales, followed by a reaction to the starting point the next day, since which the advance has been more normal in its character, closing to-day at \$36. The transactions in this stock reached over 33,000 shares.

Kearsarge, which is supposed to be benefited by the discovery in the Centennial, was also in demand and rapidly advanced like its near neighbor, from \$14 1/2 to \$25 1/2, reacting to \$17 and again advancing to \$23—holding its advance within a small fraction. Butte and Boston, which, for some reason has been depressed by parties who are supposed to be well posted in its condition, has within a few days past been in demand by strong buyers and advanced from \$14 1/2 to \$25 1/2, the latter price being touched to day, followed by a reaction to \$20 and later sales at \$22 1/2, making a gain of \$8 1/2 for the week. A friend at our elbow makes the following prediction, that during the year 1890, Calumet and Hecla will sell at \$350, Tamarack at \$225, Quincy at \$120, Osecola at \$45, Centennial at \$60@75, Kearsarge at \$30@35, and Butte at \$30. We shall see.

The lower grade of copper stocks has felt the influence of the boom this week to some extent, and we believe there is money to be made in buying this class.

Allouez advanced from \$4 1/2 to \$6.

Huron declined to \$3 on rumors that an assessment would be called for, but quickly rallied on the denial of the report, and advanced to \$4 1/2.

National sold at \$2@2 1/2.

Ridge at \$1 1/2.

Arnold at 52 1/2@87 1/2c.

Washington at 37 1/2c.

Santa Fe has advanced to 60c. under the influence of the general market, but we hear nothing of a favorable nature which should cause it to sell higher than last week.

Central has been dealt in to a moderate extent, advancing from \$10 (April 30) to \$16.

The silver stocks show signs of increasing activity, although prices have not materially changed.

Dunkin sold up to 75@77 1/2c.

Crescent at 10c., Catalpa at 30c., and Breece at 45@47 1/2c.

By Telegraph.—Franklin, \$18 1/2; Santa Fe, 65 cents; Butte and Boston, \$22; Centennial Mining, \$38; Calumet and Hecla, \$30 1/2; Montana, \$53 1/2; Quincy, \$96; Kearsarge, 22 1/2c.

Denver. May 12.

(From our Special Correspondent.)

Market quiet and slow during the past week. Home money seems to be partly exhausted, or so much of it has been locked up in stocks waiting for a rise in price that actual transactions are not as plentiful as the brokers desire. Steps are being taken, however, in the listing of, and selling, stocks in Eastern localities that will assist in adding to the volume of business.

If the programme outlined by the new Board of Directors is carried out, many needed reforms will be brought about in the manner of doing business on the Exchange, and also in the manner of conducting its affairs. It is quite probable that the members and the directors will work in harmony, as the latter have manifested a disposition to act upon all suggestions calculated to promote the welfare of the Exchange and to listen to any grievances the members may have. The members claim that the former board of directors entirely ignored them, and as a result considerable ill feeling was stirred up. A meeting of the members was held last Thursday evening, at which speeches were made by gentlemen representing the dissatisfied element, and some very plain talk was indulged in, which has already produced good results.

The Clearing House was to have been opened on the 15th, but at the request of a number of brokers, who have not had time to become familiar with the rules of the institution, the opening was postponed until the 22d. The establishing of a clearing-house will have a good effect. It should have been organized long ago.

The new listing committee have given notice that they will not accept any property that does not possess genuine merit, or that they would not be willing to invest their own money in. Had this course been pursued by the previous committee the market would not be overcrowded with a lot of properties that the public refuses to invest in.

Hereafter none but good mines and first-class "prospects" will be accepted by the listing committee. This will mark a new era in the Exchange and gain for it public confidence, the missing link which ex-president Batchelder says is so sadly needed.

The building committee is pushing matters with

all possible dispatch. First and second mortgage bonds have been issued and will be placed in a day or two, and it is thought that work on the new building will be commenced in a couple of weeks. It is the intention to have the building completed by January 1st, 1891.

The yearly dues have been raised from \$25 to \$40, the increase being found necessary in order to meet the running expenses of the Exchange. The listing fee has also been advanced; the matter was fully mentioned in our last issue.

President Taylor has been in Kansas City all week looking after the May Mazepastock, which was put on sale in that market on last Thursday.

Director Sheedy and A. C. Wynkoop, of the Mining Industry, are in Washington working against the free entry of silver-lead ores.

The Denver City, of Leadville, now listed on the New York Exchange, will be called here June 9th. The reorganized Brownlow will be put on sale next Thursday, May 15th.

Prices and sales during the week ending May 12th.

Company.	Open- ing.	H.	L.	Clos- ing.	Sales.
Alleghany, Colo.....	28*	29	24	27	6,800
Amity, Colo.....	13*	13	09	10 1/2	8,100
Bangkok, C. B., Colo.....	11 1/2	14	10 1/2	11 1/2	17,500
Bates-Hunter, Colo.....	27*	30	24	26 1/2	38,500
Brownlow, Colo.....	.....	.....	.....	.....	.....
Calliope, Colo.....	45	45	42	42	2,400
Clay County, Colo.....	39a	44	24	24b	100
Emmons, Colo.....	23*	23	20	20b	3,800
Hard Money, Colo.....	10b	10	08	08	4,500
John Jay, Colo.....	27*	20	25	26	12,300
Little Rule, Colo.....	51*	51	50	51	1,900
Matchless, Colo.....	120b	200	117b	118b	.....
May-Mazepa, Colo.....	63	50	60	51 1/2	.....
Mollie Gibson, Colo.....	50	60a	30b	40b	.....
Oro, Colo.....	500b	850a	300b	600b	.....
Pay Rock, Colo.....	07	07 1/2	05 1/2	06 3/4	42,600
Puzzler, Colo.....	21*	24	20	21	4,100
Reed-National, Colo.....	56	58	55	58	5,500
Rialto, Colo.....	11 1/2b	11 1/2	10 1/2	10 1/2	200
Silver Cord, Colo.....	36	37	35	35b	1,500
Whale, Colo.....	32 1/2	32 1/2	30	30	1,700

PROSPECTS.

Argonaut, Colo.....	22*	22	16	17b	5,600
Aspen United, Colo.....	12	16	10	10	12,400
Big Indian, Colo.....	21	21	19	18	900
Big Six, Colo.....	16	20	15	14b	9,400
Cash, Colo.....	22*	22	20	20 1/2	8,500
Claudia J., Colo.....	14a	14	09	09 1/2	3,100
Denver Gas & Oil, Colo.....	25*	28	21	21b	17,500
Diamond B., Colo.....	12*	13	09	10	21,900
Golden Treasure, Colo.....	30	22	18	20	1,000
Ironclad, Colo.....	25 1/2*	26	20	21	10,400
Legal Tender, Colo.....	19*	10	08 1/2	08 1/2	47,600
Morning Glim, Colo.....	47b	52	47	49*	12,100
Potosi, Colo.....	38*	38	20	22b	112,400

Total for the week..... 415,200

*Buyer 30. †Buyer 60. ‡Seller 61. §Seller 30. a Asked. b Bid.

Kansas City. May 13.

Company.	Opening.	H.	L.	Closing.	Sales.
Argonaut.....	10 1/2	20 1/2	10 1/2	21 1/2*	35,900
Bates-Hunter.....	24 1/2	29	24 1/2	25	198,200
Big Six.....	19	20	17	17	18,400
Brownlow.....	40	40	.....	.....	.....
Cash Gold.....	21 1/2	22	21	22	43,500
Clay County.....	38	38 1/2	36	36	37,900
Diamond B.....	12 1/2	13 1/2	10 1/2	13 1/2†	700
Hard Money.....	14 1/2	14 1/2	14	14 1/2	8,800
Ironclad.....	26†	26†	19†	21†	1,500
King Jack.....	75†	77	75	.....	2,100
Little Nugget.....	1.12	1.13	1.11	1.13	6,400
Little Rule.....	50	51 1/2	50†	.....	8,500
May Mazepa.....	1.20†	1.20†	59 1/2	62	126,300
Minnequa Zinc M. Co.....	25 1/2	27	25	26	14,400
Monte Cristo.....	13 1/2	15	13 1/2	14	61,900
Morning Glim.....	51	52	50	52	80,900
Pay Rock.....	07 1/2†	08 1/2	07 1/2	.....	12,200
Pelican.....	26 1/2	27 1/2	26 1/2	27 1/2	47,100
Potosi.....	36†	38†	36	.....	.....

*Buyer 30. †Bid. ‡Asked.

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

Iron Stocks.—There has not been much change in the price of these stocks for the past week. Prices have mainly held their own, in some cases there being a very slight advance, but nothing material, and the demand for stocks has been slight. The stagnation in iron sales has had its effect on stocks, but this, it is thought, will soon give place to greater activity in the way of sales, and stocks will then be in greater demand. Shipments of ore are going forward with the utmost dispatch in some sections, especially on the Gobeic range; it is impossible for the mines to get plenty of cars to handle the ore as fast as they want to send it out. This will probably be remedied in the near future.

Gold Stocks.—These stocks have been rather quiet through the dull times of the winter and the spring so far; in fact, we have hardly had any spring as yet, the weather being cold and snow falling more or less from day to day. The work at the Ropes, the Grayling and the Michigan is being carried on about as usual.

The Cleveland officers of the Michigan Company and directors, having such immense iron interests to attend to that they could not give the time and attention to the management of the Michigan Company which they felt the mine deserved and should have, have resigned from the directorship. James Pickands, president; G. A. Garretson, vice-president; W. G. Mather, secretary and treasurer, have given place to a new board of directors, all residents of the Upper Peninsula, and very

much nearer to the mine. The new board consists of Peter White, president of the First National Bank of Marquette, Mich.; Mr. Samuel Mitchell, president of the Jackson Iron mine, Negaunee, Mich.; A. W. Meyers, Ishpeming, Mich.; Mr. James R. Cooper, superintendent of the Detroit and Lake Superior Copper Company's smelting works, Houghton, Mich., and David M. Ford. E. H. Tower, vice-president of the First National Bank of Marquette, secretary and treasurer. The new Board of Directors being all within hailing distance of the mine and office, it is intended to have frequent meetings of the board until this becomes thoroughly conversant with the affairs of the company and decides upon the policy to be pursued. As far as the opinion of the board has been expressed, it is the intention to increase the mining force at once and proceed with the sinking of shafts, and drifting opening up the mine so as to be able to furnish sufficient rock to supply a larger milling plant which it is proposed to erect just as soon as the mine is placed in shape to deliver the rock. There will be a full meeting of the board of directors at the office in Marquette on Thursday, May 14, when matters will be more fully discussed. The yield from the low grade rock run through the little mill last month has been retorted and melted down and gives a gold brick at the value of about \$1,000.

At the Ropes mill they are expecting their 5-foot Huntington mill every day, it having been shipped by the makers, Messrs. Fraser & Chalmers, of Chicago, who will send an expert to see to the setting up and operate the mill under guarantee.

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co.....	\$25.00	\$65.00	
Aurora Iron Co.....	25 00	7.50	8.00
Champion Iron Co.....	25 00	\$100.00	102.00
Chandler Iron Co.....	25 00	37.50	40.00
Chapin Iron Mining Co.....	25 00	30.00	33.00
Chicago & Minn. Ore Co.....	100.00	110.00	115.00
Cleveland Iron Co.....	25 00	18.50	19.00
Germania.....	25 00	11.50	12.00
Jackson Iron Co.....	25 00	110.00	
Lake Superior Iron Co.....	25 00	67.00	68.50
Milwaukee Iron Co.....	25 00	5.50	6.50
Minnesota Iron Co.....	100.00	83.50	85.00
Montreal Iron Co.....	25 00	9.00	10.50
Norrie (Metropolitan).....	25 00	75.00	80.00
Odanah Iron Co.....	25 00	20.00	22.00
Pittsburg Lake Ancefine Co.....	25 00	170.00	175.00
Republic Iron Co.....	25 00	45.00	46.00

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mfg. Co.....			.50
Grayling Gold & Silver Co.....	\$25.00		.55
Michigan Gold Co.....	25.00	\$1.75	
Peninsula Gold & Silver Co.....	25.00		
Ropes Gold & Silver Co.....	25.00		*2.35

* Actual sales were made at these prices.

Minneapolis.

Company.	Bid.	Asked.
Badger Silver Mfg. Co.....		6.50
Bear View S. Mg. Co.....		1.50
Bessemer Consol. I. M. Co.....	2.00	2.50
Big Ox Mg. & Rec. Co.....		1.50
Black Hills Tin M. Co.....	1.00	1.50
Brotherton.....		
Cent. Mont. Placer M. Co.....		
Champion Con.....		
Comstock M. Co. Mich.....		
Deer Lodge Mg. & Sm. Co.....	.18	.25
Dot Iron Mg. Co.....	.70	1.00
Fairview S. Mining Co.....	.20	.50
Galena Silver Mg. & M. Co.....	.10	.25
Getcagumee G. & S. Mg. Co.....		
Glengary S. Mg. Co., Mont.....	1.00	1.25
Gogebic Iron Mg. Co.....	3.00	4.00
Iron Duke Mg. Co.....	2.00	4.00
Iron Mountain.....		1.25
Kakabeka.....		1.00
Keystone Mg. Co.....		1.00
La Belle Mg. Co.....	2.25	3.00
Lakeside I. M. Co.....		
Mil.-Mns. Iron Mfg. Co.....	.02 1/2	.10
North Shore S. Mg. Co.....	.95	.95
N. W. Coal Mg. Co.....	2.35	3.00
Old Veteran G. & S. Mg. Co.....		.30
Phoenix Iron M. Co.....		45.00
Phoenix Iron Works.....	30.00	45.00
Silver King Mg. Co.....	.75	1.00
Sunrise M. & M. Co.....		
Thunder Bay G. & S. M. Co.....	.90	1.00
United Iron & Land Syndicate.....	3.00	4.00
White Fish Lake Mg. & Mfg. Co.....	1.20	2.00
White Spar Mica Mg. Co.....	.90	1.00
York Iron Works.....		40.00

* Actual sales.

PIPE LINE CERTIFICATES.

(Special Report by Messrs. Watson & Gibson.)

The petroleum market, while stronger in tone and quotations, has not caught on to the general drift of speculative markets. For some reason it has not been a favorite with speculators and it "hangs fire." There is a movement to secure the listing of Ohio oil, and when this is done there will be more activity. The prospect is for higher prices for Pennsylvania oil when any activity occurs.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
May 10.....	84 3/4	85 3/4	84 3/4	85 1/4	91,000
12.....	85 3/4	86 3/4	85 3/4	85 3/4	55,000
13.....	86 3/4	87 3/4	86 3/4	86 3/4	54,000
14.....	86 3/4	87 3/4	86 3/4	86 3/4	38,000
15.....	87 3/4	87 3/4	87 3/4	87 3/4	36,000
16.....	87 3/4	87 3/4	87 3/4	87 3/4	46,000
Total sales in.....					370,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
May 10.....	85 1/4	85 3/4	85 1/4	85 3/4	12,000
12.....	85 1/4	86 1/4	85 1/4	85 3/4	60,000
13.....	85 1/4	86 1/4	85 1/4	85 3/4	40,000
14.....	86 1/4	87 1/4	86 1/4	86 3/4	105,000
15.....	87 1/4	87 3/4	86 3/4	87 1/4	153,400
16.....	87 1/4	87 3/4	86 3/4	86 3/4	184,000
Total sales in barrels.....					554,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 16.

Statistics.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending May 10th, 1890, compared with the same period last year:

Regions.	May 10, 1890.	May 11, 1889.	Difference.
Wyoming Region, Tons	378,206	346,196	Inc. 32,010
Lehigh Region ..	149,469	122,312	Inc. 27,157
Scranton Region ..	213,173	190,719	Inc. 22,454
Total.....	740,848	659,227	Inc. 81,621
Total for year to date..	9,831,500	10,158,497	Dec. 276,997

PRODUCTION OF BITUMINOUS COAL for week ending May 10th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2,240 lbs.	1890.	1889.
Phila. & Erie R.R.....	12,702	44,786
Cumberland, Md.....	77,709	1,354,420
Barclay, Pa.....	12,517	50,803
Broad Top, Pa.....	9,255	297,794
Clearfield, Pa.....	178,872	1,457,720
Allegheny, Pa.....	120,354	497,288
Beach Creek, Pa.....	42,285	702,176
Pocahontas Flat Top.....	73,233	707,831
Kanawha, W. Va.....	132,734	757,768
Total.....	339,480	5,771,385
† Week ending May 7.		
‡ May 8.		

WESTERN SHIPMENTS.

Pittsburg, Pa.....	122,301	346,462	220,893
Westmoreland, Pa.....	136,784	653,472	536,857
Monongahela, Pa.....	110,205	102,884	75,718
Total.....	69,290	1,102,818	833,468
Grand total.....	408,770	6,874,203	5,162,391

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending May 10th, and year from January 1st, in tons of 2,000 lbs.: Week, 97,205 tons; year, 1,982,308 tons; to corresponding date in 1889, 1,647,047.

† Estimated.

Anthracite.

The meeting of the sales agents was held on the 14th inst., but did not result, as was expected, in a rise in the price of coal. The increase, however, it is confidently anticipated, will be decided upon at the next meeting, which is to be held on the 27th inst. Perfect harmony is said to have marked the proceedings, and the entire absence of any friction between the various interests was thought to be noteworthy.

The week has been marked by no striking feature. Prices remain firm and unchanged, and, if there is any difference, buyers are more active or eager than sellers. There is a comfortable feeling about contracts, which is not in the slightest degree disturbed by any expectation of a general strike on the eight-hour question. Its impracticability applied to anthracite or, indeed, to bituminous miners, who are paid by the car or the ton, and rarely work more than six or seven hours, strikes all concerned. Reports from many of the mining centers state that all is quiet, that the men have neither the desire or intention to strike, and that so far from asking for shorter hours many or most of them would rather work longer hours and earn more money. There is no sign anywhere of any increase in stock, except in pea and huckwheat, which are weak. The stocks on hand decreased during the past month some 175,000 tons, and it is generally agreed that the production for May can be kept down to 2,500,000 tons. The various interests will shut down between now and the end of the month, and dealers and consumers may look forward to having to pay more for coal in a very short time than they are paying now.

The following are the f.o.b. quotations of the large companies. Individual operators are now getting nearly circular rates. Broken, \$3.40; egg, \$3.40; stove, \$3.50; chestnut, \$3.25.

The New York Retail Coal Trade.

The regular meeting of the exchange will be held this evening, at eight o'clock, at the rooms at the Grand Opera House. The third annual excursion will start on Tuesday, May 20th, for Reading, Pottsville and Harrisburg. The tickets are limited in number and must be procured not later than Friday night. There will probably be a few left for sale, to members at the meeting. The committees appointed to harmonize matters in the Harlem and west side districts will make their reports at this meeting.

Bituminous.

There is considerable feeling of relief among the New York bituminous coal men that a disturbing element in the form of one underselling operator has been removed. He has put up his price, and the result is a much better feeling. Stocks are a trifle lower this end, owing to shortness in shipping facilities, and freights have stiffened 5 cents and here and there 10 cents, with plenty of demand at the increase. There is some little uneasiness among producers in certain districts about labor troubles, and something of apprehension that when they come they will not be merely local. However, reports from all the mines to headquarters give no indications of discontent or trouble.

It is assumed that the Federation of Labor has taken its hands off until fall. The fact that the operators are not accumulating any stocks indicates that they are thoroughly informed and not at all disturbed by the situation.

Shipping for tidewater has slightly improved during the past week, and the supply is about equal to the demand, but with nothing to spare. Operators will not take orders, but while they appear to be satisfied with the state of things, they are rather chary of anticipating the immediate future. The local strikes in the bituminous regions have no general significance, and will have no effect on the market at present. Prices remain unchanged and firm at \$2.60 Baltimore and Philadelphia, \$3.50 alongside New York.

Strikes in the Bituminous Region.

A dispatch from Elmira, Pa., states that the coal miners of Tioga County, Pa., are out on strike. They demand the restoration of the old scale of wages and an additional increase of 5 per cent. At a mass meeting on Thursday delegations attended from mines at Antrim, Morris Run and Arnot, and many thousands of miners were present. It is stated that in the State of Pennsylvania 10,000 coal miners are now out on strike. We think, however, that this figure is a gross exaggeration.

Boston.

May 15.

(From our Special Correspondent.)

The anthracite coal market is stronger and more active at this port than it was a week ago. There is a noteworthy though not extraordinary increase in demand from retailers. Freights are the troublesome element. If vessels were more plenty the anthracite coal trade would be very active. The f.o.b. price of anthracite is satisfactory, and it is not believed that there will be any decline from present prices. The tendency is all the other way. While it is impossible to quote any minimum rate for individual coal, still there is no severe cutting of rates in any direction, and the company prices are well adhered to on a basis of \$3.50 f.o.b. at New York for broken and egg and \$3.65 for stove. The Philadelphia & Reading are even asking \$3.65 and \$3.75 for their coal. Some of the companies refuse to sell except for May delivery, but plenty of good coal can be bought for June delivery.

The bituminous market is quiet. The only item of interest is the re-advertising of the ferries contract for 8,000 tons. This contract was awarded to a retailer at \$3.67 delivered in the sheds, but owing to some technical trouble about the city appropriation, so it is said, the ferry directors could not sign the contract, and the now fortunate bidder took occasion to get out of his bid, which was 25 cents lower than any other. Doubtless this coal will cost the city 15 to 20 cents per ton more when the new bids are opened. The f. o. b. figures for bituminous coal continue at about \$2.40@2.50. There is no large business left in the market. The high freights are disturbing shippers somewhat, but there seems to be no help for it.

Freights are not notably higher, but vessels are in light supply and the situation favors the captains. The New York rate ranges from 75 to 85 cents; Philadelphia, \$1.05@1.10; Baltimore, \$1.15@1.20, and \$1.25 is reported in some cases.

The retail trade is light. The status of the combine is not easy to give. Nominally there has been no change. The attempt to enact a money penalty for cutting rates has failed to pass, and has been abandoned. Also a motion that dealers be left to follow circular prices or not as they saw fit has been defeated; so that affairs are left just where they were. At present there is no object for any one to cut prices, and there is no trouble. Later on it will appear whether or not a combination price can be maintained.

The receipts of coal at this port have been as follows:

	(For the week- 1890.)	(For the week- 1889.)	(For the year- 1890.)	(For the year- 1889.)
Anthracite (tons).....	32,986	25,212	405,010	340,033
Bituminous ".....	23,141	20,209	305,459	304,804
Total.....	56,127	45,421	710,469	644,837

Buffalo.

May 15.

(From our Special Correspondent.)

The demand for anthracite coal is fair. No changes to note in quotations. The mining and carrying companies are engaged in stocking up their storing wharves and distributing pockets at all points, but at this port the lake movement to Western and Northwestern ports continues light. Small dealers do not stock up in early spring now, as was the custom in years gone by. As fast as they receive orders they send their wagons to the agent of one of the large companies and obtain the

needed quantity from the local storage trestles' pocket—a hand-to-mouth method of business.

Bituminous coal is higher; dealers firm; market very unsettled in consequence of strikes and rumors of strikes expected. Supply only just adequate for daily requirements, and some varieties have to be specially ordered. Manufacturing business is good, and with the demand for tugs, propellers, etc., quite a large quantity of soft coal is used daily.

Coke quiet and unchanged.

Lake shipments have not been heavy; a large number of vessels leave light daily for want of coal cargoes, which are especially scarce for Lake Superior ports. Vessel men continue firm in their views, and will not make any concessions; on the other hand, shippers hold off for lower quotations.

The shipments of coal hence by lake from May 8th to May 14th, both days inclusive, aggregated 47,620 net tons, namely, 30,890 to Chicago, 2,700 to Milwaukee, 1,000 to Toledo, 5,800 to Superior, 4,530 to Racine, 500 to Green Bay, 1,200 to Detroit, and 1,000 to Sheboygan; total tons for this season, 221,200 net tons.

The rates of freight for past week were hence to Chicago 60c., to Milwaukee, Sheboygan, Green Bay and Menominee, 50c., to Racine 55c., to Duluth and Superior 40c., and to Toledo and Detroit 30c. Closing with little coal offered for shipment so the supply of tonnage is in excess of demand.

Receipts of coal by canal at this port for second week in May, 196 tons; shipments none.

The following paragraph from the Chicago Tribune is significant, showing how changes in the currents of trade are caused:

"Not only in general merchandise and grain, but also in coal, Chicago is losing to Lake Superior points territory that was once supplied from this city. Coal from the head of Lake Superior is being pushed far inside the lines that Chicago used to draw around her own field. 'For the loss of this coal trade Chicago is much to blame,' said Ald. J. S. Dunham. 'At a time when Lake Superior ports were endeavoring to build up their coal trade Chicago did nothing in the way of giving vessels sufficient water in the river here. Even this spring, when Hill was using every means to divert grain and coal to Lake Superior, it has been impossible to have the city appropriate sufficient money to deepen the river. When in Buffalo, Cleveland and Detroit last week, everywhere I found vesselmen strongly adverse to sending their boats here. Chicago coal men to-day are paying 20 to 25 per cent. more for bringing their coal from Buffalo than they would if there was not so much trouble and delay in the Chicago River.'"

At a meeting in this city yesterday the Lehigh Valley, the Buffalo & Geneva and the Geneva & Van Etnenville Railroads were consolidated into one company under the name of "The Lehigh Valley Railway Company." This action brings under one management the entire Lehigh Valley line of 285 miles from Buffalo to Sayre, Pa., taking in the Buffalo end, extending from this city to Lancaster, that portion of the road heretofore called the Buffalo & Geneva, and now being huilt, and the trackage from Geneva to Sayre. A new board of directors was chosen, with Mr. E. P. Wilber as president of the new company.

The Hocking Valley railroad people are reported as being in a highly excited condition on the coal freight rates this season, and meetings will be held this week to ascertain whether any of the lines are still cutting rates.

A certified copy of a \$5,000,000 mortgage to the Farmer's Loan & Trust Company upon the property of the New York, Lackawanna & Western Railway Company, leased by the Delaware, Lackawanna & Western Railroad Company, was recently filed in Erie county's County Clerk's office, in Buffalo. The mortgage bears date May 1, 1890, and the bonds are made payable May 1, 1923. The mortgage is made in view of the amount of money expended in the development of the company's terminal facilities at Buffalo and in other improvements. It is signed by Samuel Sloan, president of the road, and Fred F. Chambers, secretary; also by R. G. Roeseion, president of the Farmers' Loan and Trust Company, and E. S. Marston, secretary.

About 130,000 net tons of coal passed through the Sault Ste. Marie Canal from its opening to May 1st for Lake Superior ports.

Pittsburg.

May 15.

[From our Special Correspondent.]

Coal.—All our rivers are in good navigable order, but there is very little coal being loaded. Miners seem indifferent about working, even when they obtain all the price for mining they demand. The lower markets have a sufficient stock on hand to last the balance of the year. The amount at Louisville exceeds 16,500,000 bushels.

Shipments for may to date: Cincinnati, 1,861,000; Louisville, 2,085,000; total, 3,946,000.

Nominal rates in pools:

1st pool.....	Per 100 bushels.	3d pool.....	Per 100 bushels.
2d pool.....	\$4.75	4th pool.....	\$3.90
Railroad coal, \$5.00@5.50.	4.50		

CConnellsville Coke.—While values remain unchanged, the situation in regard to a strike is very uncertain; the next 24 hours may decide the question. No perceptible change is noted. Some of the large companies report a falling off in orders; still, most of them report a firm confidence in the

future. The car supply continues ample. Production and shipment show a falling off.

Average shipments, 900 cars per day against 1,000 the preceding week, aggregating as follows: to points west of Pittsburg, 3,375 cars; to Pittsburg and river points, 1,470 cars; points east of Pittsburg, 1,125 cars; total, 5,960 cars; total for preceding week, 6,050 cars.

Current rates: Furnace f.o.h. at ovens, \$2.15; foundry, \$2.45; crushed, \$2.65.

Freights: Pittsburg, 70c.; Mahoning and Shengango valleys, \$1.35; Cleveland, O., \$1.70; Buffalo, N. Y., \$2.25; Chicago, \$2.75; St. Louis, Mo., \$3.35; Cincinnati, O., \$2.65; Louisville, Ky., \$3.20.

FREIGHTS.

From Philadelphia to: Alexandria, .85; Annapolis, .65; Baltimore, .60; Bangor, 1.10; Bath, 1.10; Boston, 1.10; Cambridge, 1.10; Cambridgeport, 1.10; Charlestown, 1.10; Chelsea, 1.10; East Boston, 1.10; East Cambridge, 1.10; Fall River, 1.00; Gardner, 1.10; Gloucester, 1.10; Lynn, 1.20; Marblehead, 1.15; New Bedford, 1.00; Newburyport, 1.20; Portland, 1.10; Portsmouth, .60; Providence, 1.00; Quincy, Pt., 1.15; Richmond, .60; Saco, 1.20; Salem, 1.10; Washington, .85.

From Baltimore to: Boston, Mass., 1.20; Charleston, 70; Fall River, 1.20; Galveston, 3.00; New Bedford, 1.20; New Haven, 1.20; New London, 1.20; New York, N. Y., 1.15; Portsmouth, N. H., 1.25; Providence, 1.20; Richmond, 70; Salem, Mass., 1.20; Somersett, 90; Somersett, 1.20; Williamsburg, N. Y., 1.15.

From New York to: Alexandria, .85; Baltimore, .60; Gloucester, 1.10; Lynn, 1.20; Milton, 1.15; New York, 1.90; Richmond, .60; Salem, 1.10; Washington, .85.

*And discharging. †Alongside. ‡And towage. §Flat.

METAL MARKET.

NEW YORK, Friday Evening, May 16.

Prices of silver per ounce troy.

May.	Sterling Exch'ge.	London Pence.	N. Y. Cts.	May.	Sterling Exch'ge.	London Pence.	N. Y. Cts.
10	4.86	47½	1.03	14	4.86	47½	1.03
12	4.86	47½	1.03	15	4.86	47½	1.03½
13	4.86	47½	1.03	16	4.86	47½	1.03½

The actual selling rates of bullion here for the past week have been as follows: May 10, 104; May 12, 104 to 104½; May 13, 103½ to 104; May 14, 103½ to 104; May 15, 104 to 104½; May 16, 104½ to 104½. The market has been comparatively steady and firm without special news from Washington to affect market up or down. There have been some large arrivals from London of silver bars, but these shipments based on arbitrage transactions have ceased for the present.

The United States Assay Office at New York reports total receipts of silver for the week to be 532,000 ounces.

The stock of silver in smelters hands in this country at present is estimated at 4,000,000 ounces. It is being held for a higher market, and when money is needed is put in warehouse certificates.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE. Price.

	H.	L.	Sales.
May 10.....	105¼	105	60,000
May 12.....	105¼	104½	155,000
May 13.....	105¼	104	135,000
May 14.....	105	104½	52,000
May 15.....	105	104½	190,000
May 16.....	105¼	105	100,000
Total sales.....			692,000

It is said that the total stock of silver held for the advance, mostly by the refiners, amounts to about 4,000,000 ounces. Others place the figure higher than this. The U. S. Treasury has been unable to buy more than three or four hundred thousand dollars in the past month—and that at figures above the market.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars.....	80	82
Mexican dollars.....	80	82
Peruvian soles and Chilean pesos.....	74	75½
English silver.....	4.86	4.90
Five francs.....	.94	.95
Victoria sovereigns.....	4.87	4.90
Twenty francs.....	3.86	3.90
Twenty marks.....	4.74	4.78
Spanish doubloons.....	15.55	15.70
Spanish 25 pesetas.....	4.80	4.85
Mexican doubloons.....	15.55	15.70
Mexican 20 pesos.....	19.50	19.60
Ten guilders.....	3.96	4.00
Bar silver.....	104½	105½

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount, and it remained at 3 per cent. During the week the bank lost \$54,000 bullion, but the proportion of its reserve to its liabilities was raised from 41-49 to 41-97 per cent., against a decline from 40-87 to 37-34 per cent. in the

same week of last year, when its rate for discount was 2½ per cent. The bank on the 15th inst. lost £75,000 bullion on balance.

Copper.—A very firm feeling continues to characterize the entire copper market, and all indications are favorable to a higher range of values. It is understood that a few hundred thousand pounds of lake copper have changed hands during the week at 14½ for delivery this month, and holders are now standing out firmly for 15c. for further quantities. The few consumers who failed to buy freely before the late rise seem now rather disposed to hold back their orders, the advance having doubtless been too quick for them, and the higher prices demanded for the manufactured metal must also tend to reduce the number of orders given out for the manufactured goods. The following may now be regarded as the ruling quotations: Lake copper, spot, at 14½; May, at 14½; June, 14-90. Arizona at 13½@13¾. Casting brands at 13@13¼.

From Butte City we hear that the Anaconda and St. Lawrence mines were successfully reopened on the 8th inst., and the fire found to be extinguished. The water will be pumped out immediately, but it will take some two or three months before this is fully accomplished, and it is feared that the mine will be found to be in rather a bad condition.

Reports received from Europe are to the effect that American speculators have been buying furnace material on that market, but whether such purchases are made with the idea of bringing the material to this country again we have as yet been unable to ascertain.

Cable advices report a decrease of 3,300 tons in the statistics of visible supplies for the first half of May.

The London market for Chili bars and G. M. B. copper has ruled very firm all the week, the closing quotations by cable to-day being: spot, £52 12s. 6d. @ £52 15s, and futures, £53 @ £53 2s. 6d., a rise of about £2 over the closing figures of last week. For refined and manufactured sorts the latest quotations are: English tough, £55 @ £55 5s.; best selected, £57 @ £57 5s.; strong sheets, £61 5s. @ £61 10s.; India sheets, £58 @ £58 10s., and yellow metal, 6¼d. per pound.

The exports of copper during the past week were as follows:

To Liverpool.....	Copper matte.	Lbs.	
S. S. City of Chester.....	222 bbls.	224,612	\$10,000
To Hamburg.....			
S. S. Wieland.....	12 bars.	752	3,600

Tin.—The market for tin has been subjected to great and rapid fluctuations during the week, the extreme figures being for spot and May, lowest 20-80 and highest 21-30. At the lowest prices very little metal came out, the general opinion being that the lower quotations for London were caused not by any bona fide change in the condition of affairs as affecting demand stocks or shipments, but greatly by speculative manipulations, and this opinion proved to be correct, as subsequent cables brought higher prices. The shipments from the East as well as London are unusually light, and while this fact may not produce great scarcity this month it is the more certain to have this result in June. Advices are to the effect that the shipments from the East only amount to a total of 100 tons to the United States and 700 tons to London, a quantity very inadequate to meet current requirements, especially in view of the fact that the shipments last month were also abnormally small. Closing price, 21-25 spot, and May, 21-20 June, 21 July and August.

The London market has been strong with occasional relapses. The highest quotations marked during the week were £94 15s. to £94 17s. 6d. spot, and £95 7s. 6d. to £95 10s. three months, and the lowest, £93 5s. to £93 7s. 6d. spot, and £93 15s. to £93 17s. 6d. three months. The latest cable prices to-day being £94 12s. 6d. to £94 15s. spot, and £95 2s. 6d. to £95 5s. three months.

Lead.—In view of the expected early decision of the Legislature on the Mexican ore question (which is expected to-day or to-morrow), the lead market has been in rather a nervous state, and as many operators seem to think the chances are favorable to the party desirous of adopting the protective policy prices, have tended in an upward direction, and this has been assisted by very light offerings from the West. Independent of this Mexican ore question the market is really in a more satisfactory condition than for a long time past. No fresh accumulations of stocks have been taking place, and on the other hand the stocks which were left in warehouse at the time of the Corwith failure have been greatly diminished and the supplies from Mexico have fallen off very considerably while demand has certainly been growing. All these facts seem to justify a firmer market even if Mexican ores were admitted free of duty or subject to a lower tariff than the McKinley bill provides for, and consequently we don't anticipate any serious decline in prices in any case. During the week a few hundred tons changed hands at 4-10, at which figures there are still buyers and no sellers below 4-15.

The latest London quotations are: Spanish lead, £13; English lead, £13 5s.

Mr. L. D. Kingsland, of the Kingsland & Douglas Manufacturing Company, who has made a recent trip to Mexico, expresses in *Farm Implement News* the fears that the Mexican retaliatory duties on corn, cotton, live stock and other Western and

Southern products will be followed by similar duties against American manufactures.

"Under our tariff rebuffs," says Mr. Kingsland, "Mexico is rapidly preparing to establish metallurgical and other industries of her own and to extend her trade relations with Europe. I rode in the train from Chihuahua to Laredo with Senor Arroyo de Anda, president of the Mexican Congress—whom I have known for many years—and he told me, in his perfectly polite but straightforward way, that we Americans, without meaning to do so, were forcing Mexico into a position of industrial independence. Our duties on Mexican lead ores would simply result in the development of industries for their treatment on the Mexican side of the Rio Grande, the bullion would go to England, and the exchange would be made in that country. He himself had just let the contract for an \$80,000 smelting plant, to be erected in Monterey."

The St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: "Lead since our last report has shown some very healthy features. An excellent demand from both speculators and consumers has cropped out. Owing to but limited offerings transactions were comparatively light, probably not aggregating more than 700 tons at prices ranging from 3'80@3'90c. At the close all brands hold firmly at 3'90c., and sellers appear to be anticipating a still further rise."

The Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "Little of interest has transpired since our last report. Lead is stronger again, but sales have been light at 3'95@4c., according to brand and delivery. The closing is quiet but firm at these quotations."

Spelter is again rather firmer at 5'25 for prime Western. The London quotations are £22 for specials, and £22 5s. for ordinaries.

Antimony continues very firm, with Cookson's quoted at 25, and Hallett's at 19 3/4.

Quicksilver.—Due to a stronger market in London, where the metal has advanced to £10 10s., the price in New York is higher, quotations ranging from \$52@53.

Nickel.—Not much doing. We quote 70c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 16.

Pig Iron.—The sharpest observer will be unable to detect any appreciable change in the condition of this market. The dullness is, if anything, greater than last week, large orders being as scarce as the proverbial hen's teeth. The precise moment when the market will arouse from its present lethargy is something which apparently no one knows, iron men, however, confessing that they do not expect any change for the better much before the middle of June. Prices are not lower; in fact, quotations offered last week are equally applicable at the present writing. For some reason consumers still show no inclination to buy. Only the absolutely necessary trading is being done. In other cities rumors of large sales, based on nothing as well as on truth, are numerous, but the fact that here not even the vaguest reports of heavy transactions are ever met with, will give some idea on the quiet prevailing in the market.

We quote this week, Southern iron, No. 1, \$16.75 @ \$17.50; No. 2, \$16.00 @ \$16.50. No. 1, Northern, \$18 @ \$19, and No. 2, \$17 @ \$18.

Scotch Pig Iron.—Only a small sized business is done in Scotch pig. We quote nominally: Coltness, \$25.25 @ \$25.50; Dalmellington, \$22 @ \$22.25, and Eglinton, \$19.25 @ \$19.50.

Steel Rails.—A decline in prices, unattended by any increase in the volume of business, is the only noteworthy event in this market. There have been reports of some sales, but no definite information as to prices could be learned. Quotations are \$31 @ \$32, and dealers are inclined to think a further decline is not to be apprehended.

Spiegeleisen and Ferro-manganese.—There has been little or nothing doing in either of these. Quotations are for 20 per cent. spiegel \$31 @ \$32, and for 80 per cent. ferro-manganese \$79 @ \$82 for future delivery.

Merchant Steel.—A very good week in merchant steel is reported, and a satisfactory amount of business has been transacted. While prices have not advanced, yet buyers show an easier disposition to pay manufacturers' figures, and the demand has been quite good. We quote: Best English tool steel, 15c. net; American tool steel, 7 1/2 @ 10c.; special grades, 13 @ 20c.; crucible machinery steel, 5c.; open-hearth spring, 2 1/2 c.; tire steel, 2 1/2 c.; toe calks, 2 1/2 c.; flat file, 4 1/2 c.; mill file, 5 1/2 c.; taper file, 7 1/2 c.; first quality sheet, 10c.; second quality sheet, 8c.

Tubes and Pipe.—A strike, to which reference will be found in our industrial news column, is reported at the National Tube Works, at McKeesport, Pa., but the officers of the company do not anticipate any serious difficulties. Thus far, a very good business has been the rule, and the past week has been no exception. The schedule of prices is not subject to change, and ruling discounts on car lots are 47 1/2 per cent. on butt, black; 40 on galvanized; 60 on lap, black, and 47 1/2 on lap, galvanized; 40 on 1 1/2-inch boilers; 50 for 2 to 4-inch, and 52 1/2 on larger than 4-inch; casing, all sizes, 50 per cent.

Rail Fastenings.—Unchanged as to dullness. We quote spikes 2'05c.; angle plates, 1'90c.; bolts and square nuts, 2'70c., and hex. nuts, 2'95c.

Structural Iron and Steel.—There has been only a fair amount of business transacted during the week, some manufacturers reporting an excellent trade, while others claiming but a moderate business. All, however, agree that the prospects for this year are of a very promising nature. Prices in some instances have fallen off slightly, but on the whole, they have been well maintained. We quote this week: Universal plates, 2'25; bridge plates, 2'20@2'25; angles, 2'10@2'15; tees, 2'50; beams, 2'10.

LOUISVILLE, May 13.

(Special report by HALL BROS. & Co.)

The market has been rather quiet, with only a fair amount of trading. The same irregularities exist that have prevailed for some time. Buyers have been testing the situation by inquiring for prices on round lots, though but few of them have materialized into purchasers. Furnaces differ in their views as to the situation, and in some instances there is as much as \$1 per ton difference in their prices. Many of the buyers, within the last few weeks, have purchased for their requirements for several months ahead, and a number of the furnaces, on the other hand, have their order books comfortably filled for sixty to ninety days, and refuse orders for certain grades; yet there are other ready sellers for all grades, and every inquiry is promptly met, and some shading of prices is being indulged in.

Hot Blast Foundry Irons.

Southern Coke No. 1.....	14.75@	15.00.
" " No. 2.....	14.00@	14.50.
" " No. 3.....	13.50@	13.75.
Mahoning Valley, Lake ore mixture.....	17.50@	18.50.
Southern Charcoal No. 1.....	17.00@	17.50.
" " No. 2.....	16.50@	17.00.
Missouri " No. 1.....	18.00@	18.50.
" " No. 2.....	17.00@	17.50.

Forge Irons.

Neutral Coke.....	13.00@	13.50.
Cold Short.....	13.00@	13.25.
Mottled.....	12.00@	12.50.

Car Wheel and Malleable Irons.

Southern (standard brands).....	22.00@	23.00
(other brands).....	18.00@	19.00
Lake Superior.....	22.50@	23.00

PHILADELPHIA, May 16.

(From our Special Correspondent.)

Pig Iron.—A hand to mouth trade in iron has prevailed all week, despite several threatened sales of large lots. Stocks at foundries and mills are low, but consumption keeps up. Furnace stocks are increasing at a good many points. No. 1 Foundry is quiet at \$18@18.50 for Northern, while Southern has sold as much as \$2 under these figures. No. 2 is firm at \$17@17.25, and is not offered so freely as No. 1 since a good deal of the better No. 2 has been contracted for for forward delivery. Gray Forge is fairly active at \$15.50@16. Makers are at sea regarding probabilities, and confess things are not going according to their anticipations. American Bessemer is quoted \$20 at furnace, and foreign \$21@21.50.

Foreign Material.—Quotations, \$31@32, with sales of large and small lots at inside figure for spiegel. Ferromanganese is quiet at \$80.

Steel Billets.—As rail buyers are now credited with the intention of heavy buying, there is a better feeling among billet manufacturers, though the orders placed this week were not particularly large. Angles are 2'15; tees, 2'60; beam and channels, 3'10.

Steel Rails.—A large business has been quietly done during the past few days, but at \$32@32.50 on moderate orders, and at something less on large orders. Much more business is promised.

Old Rails.—Quotations are given to-day based on \$23 at seaboard.

Scrap.—Wrought sells quickly at \$22. All other kinds are dull. Quotations, \$29@30.

Blooms.—Business is of moderate proportions. Charcoal blooms run all the way from \$52 to \$54.50. Several lots of anthracite have been rated at \$44.

Muck Bars.—A sale was made to-day at \$23, delivered, which is considered very low, but offers are under consideration at 50 cents less.

Merchant Bars.—Refined iron is going in good-sized lots at 1'80 to 1'90. A good week's business has been done and a better feeling exists all around than for some months.

Nails.—A fair demand is in progress for nails at the lowest prices reached this year.

Skelp.—Buyers are ready to place orders, but makers refuse to come down to their views. Quotations are 1'80 and 1'95 respectively.

Sheet Iron.—Business is quiet, though all mills are full of orders, and card rates are upheld.

Plate and Tank.—A good volume of business is in sight, aggregating, according to one authority, between six and seven thousand tons. Prices on large orders have once more weakened, though ordinary tank is sold at \$2@2.10. Shell iron at \$2.40 and steel, \$2.70.

Structural Iron.—The mills are crowded with work. A shading from bottom prices would like

ly bring out a good deal of business. From indications there will be a drag on angles, sheared plates and tees.

PITTSBURG, May 15.

(From our Special Correspondent.)

Raw Iron and Steel.—Trade during the week shows no material change as relates to values; we have heard of no low price sales, such as were reported for some weeks back; in fact, the opinion seems to be pretty general that the bottom has been touched, and that the next movement will be favorable to holders and makers. Without exception, sellers report a larger inquiry than for some time past, with offers to buy provided prices were shaded. Sellers seem to have made up their mind that there will be no more shading. So far as values are concerned, prices are below what they ought to be; the general impression is that the present is the time to buy, that the stock of last year's ore is about exhausted, that iron made with ore sold for this year's delivery cannot be converted into iron and sold at present values.

Prices started on the down grade are hard to stop, and; cannot be brought up with a round turn, except by the appearance of extraordinary conditions. There is a general feeling of surprise among well-informed dealers that the market should be so weak as it has been for a month past under conditions that are usually regarded as favorable to a firm market. The consumption of pig iron is very large and steady, and the production is not greatly in excess of the demand. While there is an abundance of iron with which to fill all orders, still the furnace men are not threatened with any accumulation of stock, either in their own yards or with their consumers, and consequently there is no apparent necessity for a decline in values. At this writing the market is certainly stronger than it was early in the week, still the feeling is unsettled; dealers generally seem to lack confidence, if we except city furnaces, who to a certain extent have withdrawn their iron from the market, having an abiding confidence that the time for better prices is not far distant. While there are some sellers at present prices, there are none to be found who will accept these figures for delivery after mid-summer; this fact certainly shows a confidence in the future, to say the least.

There seems to be a growing belief in a more active market, and in higher prices before long; while some are of the opinion that there will not be much change until after the 1st of July.

Prices.

Coke or Bituminous Pig—	20% Spiegel at seaboard.....	\$30.00@31.00	
Foundry No. 1.....	17.25@17.50	Muck-Bar.....	27.00@27.25
Foundry No. 2.....	16.25@16.50	Steel Blooms.....	27.50@27.75
Gray F. No. 3.....	15.25@15.50	Steel Slabs.....	27.50@28.00
" " No. 4.....	15.00@	Steel Cr'h Ends.....	20.50@21.00
White.....	14.25	Steel Bl. Ends.....	20.00@21.00
Mottled.....	14.25	Ferro-Man., 80%, seaboard.....	80.50@81.00
Silvery.....	17.50@19.50	Steel Billets.....	27.50@28.00
Bessemer.....	17.50@18.00	Old Iron Rails.....	23.50@24.00
Low Phos.....	25.00@25.50	Low Steel Rails.....	21.50@
Charcoal Pig—		No. 1 W. Scrap.....	20.00@20.50
Foundry No. 1.....	23.50@24.50	No. 2 W. Scrap.....	17.50@
Foundry No. 2.....	22.00@22.75	Steel Rails.....	34.00@35.00
Cold Blast.....	25.00@26.00	" " Light sec.....	34.00@37.00
Warm-Blast.....	24.00@25.00	Bar Iron, nom.....	1.85@ 1.90
10 + 12% Spiegel.....	29.00 Nom.	Iron Nails.....	1.90
		Wire Nails.....	2.30@ 2.35

Coal and Coke Smelted Lake Ore.

2,000 Tons Bessemer.....	\$17.50 cash.
2,000 Tons Grey Forge.....	15.00 cash
2,000 Tons Bessemer.....	17.65 cash.
2,000 Tons Bessemer.....	17.50 cash.
1,500 Tons Grey Forge.....	15.00 cash.
1,000 Tons Bessemer.....	17.50 cash.
500 Tons Grey Forge City prime.....	15.50 cash.
500 Tons White Iron.....	14.25 cash.
500 Tons White and Mottled.....	14.25 cash.
200 Tons Grey Forge.....	15.00 cash.
200 Tons of Bessemer.....	16.50 cash.
150 Tons Grey Forge City prime.....	15.50 cash.
150 Tons White and Mottled.....	14.50 cash.
100 Tons Bessemer City prime.....	18.00 cash.
50 Tons Bessemer.....	18.50 cash.
50 Tons No. 2 Foundry.....	16.25 cash.

Coke, Native Ore.

50 Tons Silvery.....	17.50 cash.
50 Tons No. 2 Foundry, all ore.....	17.50 cash.
50 Tons Silvery Extra.....	19.00 cash.
50 Tons No. 2 Foundry.....	16.75 cash.

Charcoal.

75 Tons Cold Blast.....	26.00 cash.
75 Tons No. 2 Foundry.....	22.75 cash.
50 Tons No. 1 Foundry.....	25.00 cash.
50 Tons Cold Blast.....	29.25 cash.

Muck Bar.

1,000 Tons Neutral, June.....	27.00 cash.
1,000 Tons Neutral, Spot.....	27.00 cash.
500 Tons Neutral.....	26.85 cash.

Steel Wire Rods.

380 Tons American Fives.....	38.50 cash.
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Steel Slabs and Billets.

3,000 Tons Billets and Slabs, June and July.....	27.50 cash.
1,500 Tons Billets and Slabs.....	27.25 cash.
500 Tons Billets and Slabs.....	28.00 cash.

Steel Bloom Ends.

350 Tons Bloom Ends.....	20.00 cash.
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Ferro-Manganese.

75 Tons 80 per cent., July, Baltimore.....	78.50 cash.
50 Tons 80 per cent., June, Baltimore.....	80.50 cash.

Old Iron and Steel Rails.

500 Tons American Ts.....	23.00 cash.
300 Tons American Ts., Valley.....	24.00 cash.
200 Tons American Ts.....	23.50 cash.

Spiegel Iron.

300 Tons Wide Grooved.....	1.80 4 mos.
250 Tons Sheared Iron.....	2.10 4 mos.
200 Tons Narrow Grooved.....	1.70 4 mos.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, May 16.

Heavy Chemicals.—On the whole we do not see that the market for heavy chemicals shows any change over last week. Without exception, business has been slack, and not many new orders were placed on the market. Nevertheless there does not appear to be a very great quantity of chemicals in store, and the remarks we have made in this column for the past three weeks apply, almost without modification, to the present state of affairs. The market has been dull and quiet. We quote this week:

Caustic soda, 60 per cent., 2 1/2 @ 3c.; 70-74 per cent., 2-50 @ 2 1/2 c.; 74-76 per cent., 2 5/8 c., according to quantity.

Caustic soda ash, very little doing at 1 50 @ 1 55c. Carbonated soda ash, 48 per cent., 1 1/2 c.; 58 per cent., 1 47 1/2 @ 1 50c.

Bleaching powder still somewhat unsettled at 1 35 @ 1 50c.

Sal soda, 87 1/2 @ 92c.

Acids.—So far as actual business is concerned the market in acids has not materially improved. Some few people took exception to our statement that the trade is worse to-day than for the corresponding period in 1889, but we have indisputable evidence that, on the whole, this is the case. Acid continues to be sold at nearly whatever prices consumers are willing to pay, and, in some instances, for even less, this being the result of competition between manufacturers. New Jersey continues to be the scene of the hottest fighting. The Newark agent of the Knickerbocker Chemical Company, is reported to have said that the "combination" would have all the trade soon, in view of which assertion (if true), we shall not be surprised at still lower prices.

An official of the Knickerbocker Chemical Company stated that all rumors of a disruption of this company, or of dissention among its members, were false. Also, that the company felt it had been a benefit, not only to its members, but to the trade at large, and that, had it not been for the Knickerbocker Chemical Company, prices would to-day be even lower than they are. This combination view is not coincided in by the independent firms. There was a report that one or two of the works belonging to "ins" had been forced to close down. This, however, was denied by the "combination."

Acid, per 100 pounds in New York and vicinity: Acetic, \$1.75 @ \$2.25; muriatic, 19-degree, 80c. @ \$1.25; muriatic, 20-degree, 90c. @ 1.50; muriatic, 22-degree, 90c. @ 1.75; nitric, 36-degree, \$2.75 @ \$3.50; nitric, 40-degree, \$3.25 @ \$4.50; nitric, 42-degree, \$3.75 @ \$4.75; sulphuric, 60-degree, 70 @ 80c., and sulphuric, 66-degree, 85c. @ \$1.

Fertilizing Chemicals.—There has been more inquiry for forward supplies, and a better feeling prevails in consequence. For some time past manufacturers have thought that prices had reached bottom, and considerable transactions in raw material have occurred during the past week or two. This week has been no exception, and sales of some importance are reported. The ammoniacals command better prices.

Oxalic acid is quiet at 6 1/2 @ 7c.

Of course buyers profit by the competitive prices. We quote high grade dried blood \$1.95 @ \$2. For the low grade the price is \$1.85 @ \$1.90. Azotine, \$1.95. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent.

phosphate, \$20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, \$18.50. Fish scrap, \$20 @ \$20.50 per ton. f.o.b. factory. Sulphate of ammonia at \$3.05 @ \$3.10 per cwt. Concentrated tankage, \$1.80 @ \$1.85. Refuse, bone black, guaranteed 70 per cent. phosphate, \$18 @ \$19 per ton. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, \$20 @ \$23; ground, \$25 @ \$26.

Charleston rock, undried, \$5.75 per ton; kiln-dried, \$6.50 @ \$7 per ton, both f. o. b. vessels at the mines. Freight by sail from Charleston to New York, \$2.25 @ \$2.50 per ton. Charleston rock, ground \$11.50 @ \$12, ex-vessel at New York.

Quotations are for 48 to 52 per cent. sulphate of potash, \$1.12 1/2 per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, \$2.37 1/2 per 100 pounds.

Mr. Paul C. Trnholm, of Charleston, S. C., sends us the following statistics, showing the shipments of phosphate rock from Charleston, S. C., April 1888, 1889 and 1890:

Table with 4 columns: Crude, 1888, Ground, 1888, Crude, 1889, Ground, 1889, Crude, 1890, Ground, 1890. Rows for Domestic and Foreign.

Kainit.—Large lots of kainit, aggregating 600 tons, have been sold during the week, and the available supply has thus been considerably diminished. Quotations continue unchanged at \$9.50 @ \$9.75.

Muriate of Potash.—The season being about at an end, trade has slackened up somewhat. There is not a great deal in store, but a plentiful supply is coming. About 450 tons arrived this week. We quote \$1.77 1/2 @ \$1.85, according to quantity.

Nitrate of Soda.—The market for nitrate is quite active, with a good amount of business transacted during the week. We quote this week \$1.70 @ \$1.75.

Brimstone.—An advancing tendency is perceptible in this market, \$21 for best mixed seconds and \$20.50 for thirds for shipment being quoted. The spot supply is not great, and some dealers profess that brimstone will rule higher ere long.

Liverpool. May 7.

[Special report by Messrs. J. P. Brunner & Co.]

Since our last there is little change to report in the position of heavy chemicals, but all round the market is in a dull state.

Soda ash quiet at 1 1/4 @ 1 1/2 d. for 48 per cent.; caustic, 1 1/2 d. @ 1 1/4 d. for 48 per cent. Carbonate high-test ash still continues very scarce. Soda crystals in moderate demand at \$3 @ \$3 1/2 s. per ton.

Caustic Soda.—At the close of last week the tone was firmer, but with little business passing the position is less strong again. In 70 per cent. makers ask \$9, while some resales have been made to-day at \$8 12s. 6d. 60 per cent., we quote \$7 17s. 6d. to \$8 2s. 6d.; 74 per cent., \$9 7s. 6d. to \$9 10s.; 76 per cent., \$10 10s. Bleaching powder flat, and \$5 10s. nominal spot value, while possibly this figure might be shaded in one quarter.

Chlorate of potash slow of sale at 4 1/4 d. to 4 3/4 d. per pound.

Bicarb. soda in moderate request at \$5 15s. per ton and upwards for one cwt. kegs, according to

brand and quality, with usual allowance for larger packages.

Sulphate of ammonia declined, and £11 3s. 9d. to £11 5s. are nearest spot values to-day for good grey, 24 per cent. f.o.b., here.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, May 16.

Bricks.—There is a fair demand for brick and a corresponding amount of business is being transacted. Bricks continue to arrive in large quantities, and there is a full supply from all points. Prices are lower, and current quotations are about as follows: Haverstraws, \$6.25 @ \$6.75 per M.; uprivers, \$5 @ \$6; Keyports, \$4 @ \$4.50; South-rivers, \$5 @ \$5.25; pales, \$2.75 @ \$3, with a good demand for the last mentioned variety.

Lime.—There have been good arrivals in lime during the week, and a fair demand is reported. As before mentioned in these columns, the supply of finishing lime has been restricted, and at present of every 1,000 barrels of Maine lime received only 150 are for finishing purposes.

Some perturbation was felt among dealers by the reports published in some newspapers to the effect that the association (Knox County Lime Association) had disbanded, or was about to do so. This rumor had a tendency to create an unsettled feeling in the market. The report has been officially denied, and we are assured by the association's New York representatives that all members express themselves satisfied with the present order of things. The association will probably continue in existence for at least another year. Quotations are: for Rockland common, \$1 per barrel; Rockland finishing, \$1.20; St. John, common and finishing, 90 @ 95c.; Glen Falls, common and finishing, 85c. @ \$1.10.

Stone.—This branch of the building material market has not been affected by the labor difficulties, which, although they came to nought, yet more or less disturbed the trade in building materials. "The stone cutters here," said a prominent dealer, "get \$4 a day and do not work very hard. In Massachusetts a great deal of trouble is being experienced by the bosses, but our market has remained as it was before May 1st." Last year's prices are, on the whole, maintained, with occasional shading by agents, who are willing to divide their commission that they may get an order.

Thus far the greatest demand has been for limestone, Scotch redstone and Long Meadow stone. A good volume of business has been transacted, and as there seems to be a fair amount of building going on, and there are indications that the future will prove equally prosperous, the stone men are not complaining.

The dealers whose business consists largely in the Nova Scotia, New Brunswick and Scotch stone, are greatly exercised over the manner in which the McKinley bill will affect them if passed in its present form. The present duty on stone is \$1 per ton, or about 6 1/2 cents per foot. The proposed duty raises this to 14 cents per foot, an increase of nearly 118 per cent.

They (the importing dealers) claim that it will practically kill their business. It is said that the late Mr. Vanderbilt's house was the last house requiring good stone, which was built of Connecticut brownstone, and that the dealers in this variety have seen their article depreciate in value and lose in popularity, till at present it is used only in flats and tenements. It is at their instigation, so the importers allege, that the duty is so greatly increased.

IMPORTS AND EXPORTS OF METALS AT NEW YORK MAY 3 TO MAY 10 AND FROM JANUARY 1.

Large table with multiple columns for Imports and Exports of Metals, listing various metal types (Steel, Pig Iron, Tin, Copper, etc.) and their respective quantities and values.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS, NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS. Lists 149 mining companies with their financial details.

g. Gold, s. Silver, l. Lead, c. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$270,000 and the Terra \$75,000. ¶ Previous to the consolidation in Aug., 1884, the California had paid \$31,850,000 in dividends, and the Con. Virginia, \$40,000,000. †† Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid \$1,850,000 in dividends. ‡‡ 1,000,000.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, May 10-16, and Sales. Includes entries like Adams, Colo., Alice, Mont., and various other mining companies.

*Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assess-ment unpaid. Dividend shares sold, 21,920. Non-dividend shares sold, 96,780. Total New Y. 118,700.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, May 9-15, and Sales. Includes entries like Atlantic, Mich., Bonanza Developm't, and various other mining companies.

*Assessment paid. Boston: Dividend shares sold, 32,200. Non-dividend shares sold, 85,430. Total Boston, 117,630.

COAL STOCKS.

Table with columns for Name of Company, Par vs. of sh'rs., May 10-16, and Sales. Includes entries like American Coal, Cambria Iron, and various other coal companies.

**Sales in New York, 186,850; in Philadelphia, 78,021. Total sales, 451,643.

San Francisco Mining Stock Quotations.

Table with columns for Company, May 9-15, and Sales. Includes entries like Alpha, Alta, Belcher, and various other mining companies.

STOCK MARKET QUOTATIONS.

Baltimore, Md.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Atlantic Coal, Balt. & N. C., Big Vein Coal, etc.

Prices bid and asked, lowest and highest, during the week ending May 14th.

Birmingham, Ala.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Ala. R. Mill Co., Alice Furnace, Anna Howe, etc.

The following closing quotations are reported to-day by C. L. Hudson & Co., members of New York Stock Exchange: CERTIFICATES.

Pittsburg, Pa.

Table with columns: COMPANY, B., A., Closing. Includes entries for Allegheny Gas Co., Bridgewater Gas Co., Chartiers Val. Gas, etc.

Prices bid, asked and closing during the week ending May 15.

Table with columns: COMPANY, Bid, Asked. Includes entries for Columbia Oil, La. Noria Mining, etc.

St. Louis, May 14.

Table with columns: COMPANY, Bid, Asked. Includes entries for Adams, Colo., American & Nettie, etc.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Carriboo, Idaho, Central Silver, Cleveland, Colo., etc.

Trust Stocks, May 16.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for American Cotton Oil, Cattle Trust, etc.

Sales at the New York Stock Exchange week ending May 16: American Cotton Oil, National Lead, Sugar, etc.

Foreign Quotations.

Table with columns: COMPANY, Highest, Lowest. Includes entries for London, Madrid, Paris, etc.

Paris.

Table with columns: COMPANY, Highest, Lowest. Includes entries for Belmez, Spain, Callao Venez, etc.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Lexington, Mont., Rio Tinto, Spain, etc.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Acid-Acetic, Muratic, etc.

Alkali.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Refined, Alum-Lump, etc.

Asbestos.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for White, at Plymouth, etc.

Barytes.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Sulph., foreign, etc.

Bleach.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Over 35 p.c., Borax, etc.

Bromine.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Sulph., etc.

China Clay.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for English, etc.

Cobalt.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Oxide, etc.

Copper.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Sulph., etc.

Cream of Tartar.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Am. 90%, etc.

Emerald.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Grain, etc.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Sal, English, etc.

THE RARER METALS.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Aluminum, Arsenic, Barium, etc.

BUILDING MATERIAL.

Table with columns: COMPANY, Bid, Asked, L. H., A. H. Includes entries for Bricks, etc.

THE ENGINEERING AND MINING JOURNAL will thank

any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.