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MR. CHARLES M. ROLKER, mining engineer, leaves in a few days for Mexico on professional business. His temporary address will be found next week in our advertising columns.

A POSITION as professor of mining engineering and physics in a Western university is open. Applications can be made to the Managing Editor of the ENGINEERING AND MINING JOURNAL at this office.

We publish this week another letter from our able correspondent DENVER on the defects of the mining law and their remedies. Nothing that we can say would make more evident the absurdities in the present practice or the necessity for an improvement in the law. This question is certainly one of the most important that is before the mining industry to-day, and the ENGINEERING AND MINING JOURNAL invites those who are interested in the subject to discuss it in these pages.

THE use of arsenic, both in the form of "powdered white" and as Paris green, London purple, and other compounds of arsenic, in agriculture, is making enormous progress. Careful and extensive experiments have been made with it by Mr. WILLIAM H. STEVENS, at Detroit, Mich., during the past two years, and with the most remarkable success. Every species of insect and worm that injure roots, or grain, or fruits is destroyed by the use of arsenous oxide, and the value of the crops have been enormously increased.

Now the report comes to us from California that the farmers have found the use of arsenic very successful in killing locusts, and as a consequence the price of arsenic in San Francisco is said to have quadrupled in price, the druggists having made "a corner" in it. As many as 80,000 pounds are said to have been used in a single county.

It probably is not known that arsenic is now made in large quantities at the mines of the Canada Consolidated Gold Mining Company at Deloro, Hastings County, Ontario. This is the only arsenic produced on the continent, and it far exceeds in purity either the English or German article. The Deloro crude arsenous oxide—which is admirably adapted to agricultural use—is from 92 to 97 per cent pure, and the Deloro refined is steadily over 99 per cent pure, or about 5 per cent purer than the average English refined and 7 per cent purer than the German refined.

The Deloro works have several hundred tons of arsenic on hand in process of refining, and can produce about six tons a day.

"WHAT is the matter with the Bassick mine?" "What is the true inwardness of the present management of the Bassick Mining Company?" are questions that are frequently asked. We have many times sent to the company's office in this city for information that might help to answer them; but not having thus far succeeded in getting it, we ask such of our readers as can throw any light upon the subject to answer them through our columns. Our mining notes have from time to time reported the financial troubles that for some months past have fallen thick and fast upon the Bassick mine; and yet but a little more than a year ago the mine was paying dividends, and only a few months ago the president of the company, then just returned from a visit to it, said he "had never seen the mine looking better." Since that time, the company has fallen deeper and deeper into debt, until it is now said to owe for wages \$35,000; for supplies, etc., \$130,000, and a further statement appeared in our last week's mining news that the president, vice-president, and another party have a judgment for \$84,500 against the company. The property, it is said, is to be sold, which, of course, would wipe out the \$10,000,000 of stock.

It is affirmed by many who claim to have knowledge, but whose statements we do not indorse, that the mine has been extravagantly managed, and that it is looking remarkably well and has large bodies of good ore in sight, and a tailings dump estimated at 150,000 tons that will pay a large profit on concentrating. It is further asserted that the miners offered to pay themselves if allowed to work the mine for thirty days, and that one of the chief stockholders had offered to pay the debts of the company, amounting then to some \$170,000, if given a lease of the mine for a year. We do not vouch for the accuracy of these statements, but they would simply be a confirmation of the president's statement a few months ago, that the mine was looking very well. Why, then, has the company been allowed to get into such straits? No satisfactory reason for this has been published, and this, no doubt, is the foundation for reports that "it is a freeze-out," and other insinuations equally complimentary to the management.

It is with regret that the ENGINEERING AND MINING JOURNAL feels called upon to give voice to these unfavorable comments; for it has many times and with great pleasure referred to the honorable reputations of the principal gentlemen in the management of this and the Horn-Silver companies as the foundation for a legitimate hope that these gentlemen would, by straightforward, open, and honest treatment of their stockholders and able management of their properties, help to redeem the industry of mining from the reproach brought upon it by the disgraceful "Com-stock methods" so often condemned in these pages. We still look to them to justify that hope and the hearty support that in this belief the ENGINEERING AND MINING JOURNAL has always accorded them.

THE NEW LAKE SUPERIOR SILVER DISTRICT.

The Thunder Bay Sentinel has published a map of the new silver region near Port Arthur, Lake Superior, Ontario, which will be of service to those who desire to make themselves familiar with this district.

The reports from Silver Mountain, which is about forty miles west of Port Arthur, are enthusiastic, and it is said that five sixths of one mine have been sold for \$250,000, although no information has yet been made public that demonstrates that amount of value in all the mines yet opened.

From all the reports we have received concerning this new mineral

district, it would appear to be an attractive field for prospectors and capitalists, though the latter class should invariably be accompanied by competent experts. The parties who own the prospects thus far discovered are for the most part men with means wholly inadequate to develop or successfully work mines; but, with the exaggerated confidence of ignorance, they are all convinced that a prospect is a mine, and they accordingly put prices upon their property which are far too high for any prudent capitalist to pay. It may be that a few bonanzas near the surface may be worked with profit; but the present owners, or those buying at their prices, will have to go through the usual experience until the owners get educated up to the appreciation of the fact that the value of a mine is the net value of the ore *actually proved* by shafts and levels, and that the man who invests his money to work a mine is the man who takes all the risk, and should have most of the chances in his favor.

The best policy for this new and promising field to follow will be to offer leases on low royalties or large interests in the property to capitalists who will develop and work the mines. The royalties asked in some other parts of Ontario are from 2 to 2½ per cent of the bullion produced, and a usual proportion of a fairly good prospect to give for the capital required to work it is from one half to four fifths, according to the value proved. Nothing can be more injurious to the interests of a new mining field than to fall into the hands of those who can not work it themselves, and who put such high prices upon the prospects as to keep capital out or cause what goes in to be unprofitable.

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.]

The Defects of the Mining Law and their Remedies.
(Continued from page 38.)

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In any revision of the mining law, the first question for consideration would be whether the provision of the existing law permitting the miner to follow his vein or lode to any depth on its dip shall be retained.

Dr. Raymond, in his "Law of the Apex," describes the uncertainties and injustice that this apparently simple right has given rise to, and the very doubtful practical decisions which have necessarily been given in certain cases, when the right is supposed to have been infringed.

In the first place, the law does not define what is a vein or lode, yet it is assumed in several important legal decisions, with very questionable propriety, that the technical meaning of the word must not be strictly adhered to. A very large number of the Western mineral deposits are, under any strict interpretation of the term, not veins or lodes at all, and a smaller class can not, except by the utmost ingenuity, be brought within the meaning of the terms. But where large interests and larger fees are at stake, lawyers and experts will exercise imagination so vividly and reason so convincingly as to persuade themselves and the courts that what at the first glance seems to be four-sided is in reality two-sided only, or that a mathematical line has really width without length. And as long as the law uses words that must be interpreted, if the law is to have any application, otherwise than in their technical sense, neither lawyer nor expert must be blamed if he stretches his arguments and illustrations in supporting his case beyond the line of strict fairness. Once accuracy in definition is admitted to be unnecessary if not impossible, the side that can enlist, by paying for it, the largest array, not of practical talent, but of brilliant wit and rhetorical power, is likely to win. The property in dispute may be worth millions; and it does seem preposterous that its tenure should depend on the interpretation of a law permitting such a latitude of meaning.

But even when the deposit in dispute is admittedly a vein or lode, Dr. Raymond's admirable synopsis of cases and arguments shows how difficult it is to decide who in some instances really possesses the apex, and in others, where the apex is known, what area of the vein or its dip is really owned by a given litigant, whose location is locked, like the sections of a Chinese puzzle, into a maze of irregular claims.

No better proof of the looseness and inadequacy of the law could be demanded than is afforded by the litigation to which it has given rise and the lack of conclusiveness in the judgments rendered.

There really seems no good reason why our Western mining law should differ from the mining law of the Eastern States, and of most of the other countries, which limit the miner's rights underground to the area that his claim covers on the surface.

Our Western law requires the discovery shaft to be in the center of the claim, and prescribes that three hundred feet may be measured on each side of the lode, which it is presumed has been traced and runs through the center of the claim. In the great majority of cases, it is not pretended that the lode or vein that gives value to the claim occupies any such position. It is quite possible so to locate a few isolated claims; but, once a mining district begins to be covered, the miner takes up all the ground vacant up to the limit allowed by law, whether the mineral is found in the center of the claim or to one side. When a patent is to be applied for, if the surveyor-general is exacting, two shafts, very shallow pits, along the center line, on an iron stain, if nothing more substantial can be found are sunk. One figure on the plat as the *discovery shaft*, another, it is taken for granted indicates the strike of the lode or vein. The whole procedure is a farce, played by the locator, the deputy United States Surveyor, and the surveyor-general.

If the law were changed and right to follow beyond the side-lines in all new claims abrogated, it would be proper to enlarge the legal maximum width of the claim to say 1000 feet, and allow the miner to place his monuments so as to cover in his judgment the largest possible area of the ore. In Michigan, mineral lands are sold in sections, like agricul-

tural, and the miner owns under ground what his surface lines carried downward would inclose. Were the great copper belt there parceled out into 1500 by 600-foot lots, Keweenaw promontory would not be the center of one of the most thriving industries of the country. Should the existing law for the West be changed, the rights of present mine-owners to follow their veins could not in equity be interfered with, and therefore all new claims would be taken up and patented under the proviso that their owners are not entitled to possession of ore-deposits, within the meaning of the law, that dip into them from the adjacent claim taken up prior to the passage of the act. Yet comparatively little confusion would arise from this cause, as, where a well-defined vein is known to exist, all the ground in the direction of its dip has been already located for a considerable distance on the nearest indication of mineral, the outlying claims generally possessing no value, but covering the dip of the vein beyond its probable profitable depth.

The size that claims should possess is a matter on which difference of opinion will exist according as it is viewed from the prospector's or the systematic miner's point of view.

The man who works the mine is seldom the one who has located the claim, and he again is often not the discoverer. Many of the most important, especially of copper properties, were discovered when too inaccessible to be valuable, located, abandoned, relocated, and then sold to the present owner. Few prospectors have the means of working a large mine, and it would be against their principles to do so if they had. They consider their province to be to locate as many claims as they can find, or as their predecessors or neighbors have abandoned, and to do just as much work as will give them a speculative value and no more, and then to "loaf around the saloons" till a "capitalist comes along." There is nothing more dangerous in the view of a genuine prospector than developing his claims, and that for palpable reasons. Not one claim out of a thousand grows into a mine, and yet almost every claim sooner or later finds a bidder, unless its worthlessness has been demonstrated. The prospector, therefore, reasons wisely when he does no more work than the law prescribes, and does that in such a manner as to prove by it as little as possible. He multiplies likewise his chances by multiplying his claims; and therefore, the smaller the claims are within certain limits, the larger the number that can be located within a given area.

The mineral-bearing ground in any given district covers a certain area. Within that area, there is always a chance of a find; beyond it, the rocks are too barren to tempt the most reckless prospector to stake off a claim and pay registration fees. If the law allowed 80-acre claims, and the whole area were laid out regularly, there would be only one quarter the number of chances that there are now when the claims are restricted to 20 acres. As the prospector "goes in for chances," the more the better. He therefore favors small claims. But the systematic miner who has invested his \$100,000 in a mill, must, to protect himself and insure reserves, certain or probable, secure more than a single claim of 1500 feet by 600 feet. He would originally have probably paid no more for his undeveloped claim had it been twice as large as it was; but now, having proved it to be valuable, and expended money on plant, which is so much waste lumber unless used, he must buy up adjacent claims, to the great advantage of the prospector. We think, therefore, it would tend to the encouragement of legitimate mining, were claims allowed to be larger. In Australia, gold claims are fixed at 20 acres, as gold quartz can be worked by associations of poor men; but copper claims may be located of 80 acres, as large capital must be invested before so cheap a metal can be made to pay, and capital can only be tempted by liberal inducements.

A more fertile source of lawsuits, though of less importance than those growing out of the Law of the Apex, is the provision of the statutes regulating the acquisition by location and the retention of mineral land.

A prospector discovers mineral in a new locality. He probably has neither a compass nor a tape-line. He paces off 1500 by 600 feet. He judges of the direction of the long axis of his claim, and piles up a few stones as center and corner monuments. He then writes his notice. This describes a claim that lies for 300 feet on each side of the initial monument or pile of stones in which the location notice is hidden (generally inclosed in a baking-powder tin). It gives the supposed direction of all the confining boundary lines, and finally endeavors to identify the locality by reference to some well-known landmark, a spring half a mile off, or some hill or tree, for which any other tree or hill would answer the purpose just as well; and gives the claim a name. Within sixty days, he records this notice.

The district in which this first location is made attracts attention, and other locations are made all around the original, by the same rule of thumb method, some previous location rather than the spring, the hill, or the tree, being used as the mark of identification.

The law requires that, in order to hold a claim, \$100 worth of work must be done upon it annually, but does not require that any record of the work done be made, or certificate of its fulfillment obtained. In very many cases, no work is ever done, the land returns into the public domain, and is relocatable; it is taken up, redescribed, and renamed, but the notice of relocation gives no clue to its previous history. When work really begins in the district, it is sure to be found that some of the valuable claims monumented do not cover the ground that has proved to be most valuable, and the swinging round process quietly begins.

In course of time, work sufficient has been done on some of the principal claims to entitle their owner to a patent. The location notice is sent in to the surveyor-general, and a United States deputy surveyor-general, who is asked for by the patent claimant, is instructed to make the survey. When he reaches the ground, he finds that the original piles of stones have, of course, long ago disappeared, and their place been taken by more recent ones. The position of the original monuments is more or less a matter of memory and testimony, and the new ones do not occupy the relation to the initial monument that the description requires; but as such correspondence rarely happens, and the monuments rather than the description must guide the surveyor, he makes the patent survey guided by such monuments as he can find, whether original or not; by the testimony, generally of those interested, as to the position of the original monument; and by his judgment, after taking in evidence the circumstances

and assumed facts as to what ground the claimant has a right to. His plat is posted on the claim, and the application for a patent is published for sixty to ninety days, that all whose rights may be infringed may file an adverse claim.

As often happens, the neighbors have taken no heed to the proceedings, or if aware that their territory is being invaded, are too poor to enter suit, and the ground claimed is secured to the claimant by United States patent, though often it is extremely difficult to identify it by the original location notice. However, the patented claim, so far as its limits are concerned, is beyond dispute, and if it was swung around, so as to cover more desirable ground than the original location that it represented, all the neighbors, in order to secure full claims, begin the swinging process, and there ensues a dance of monuments that becomes so utterly confusing that, when at last some unpatented claim is sold and acquires value, and an attempt to patent it is made, and an adverse claim is filed and brought into court, the testimony is so hopelessly contradictory, and the swearing to exactly opposite facts so square and strong, that a jury might be pardoned if they decided to base their verdict on the toss of a penny.

The standard of veracity is not high in a Western mining camp. The piles of stones designated as monuments are about as flimsy, and the descriptions in the location notice are as vague and indefinite, as the monuments are unsubstantial. Therefore there are in the regulations and practice affecting the location of claims all the ingredients for vexatious litigation, and there are lawyers enough to work up these ingredients into explosive compounds. DENVER.

MODERN AMERICAN METHODS OF COPPER SMELTING.*

By Edward D. Peters, Jr., M.E., M.D.

CHAPTER VII.

CALCINING-FURNACES.

IV. Reverberatory Calciners.—*a. With Open Hearth.*—This division includes virtually all of the calciners in every day use in this country for the calcination of copper-bearing sulphides where neither the manufacture of sulphuric acid nor other outside issues have influenced the choice of apparatus.

The essential features of the ordinary reverberatory calciner are, a hearth, heated by a fire-place, from which it is ordinarily separated by the bridge-wall, and accessible by certain openings through the side walls, the whole being covered by a flat arch against which the flame reverberates in its passage from the grate to the flue, thus being brought momentarily in contact with the ore spread upon the hearth, while the combined gases from fuel and charge pass into the open air through a chimney, in many cases first traversing a series of flues and chambers for the purpose of retaining such particles of metal as may have been either chemically or mechanically borne away by the rapid draught.

A very small grate surface, as compared with the hearth area, distinguishes this type from the reverberatory smelting-furnace, and corresponds to the very moderate temperature suited to the process of calcination, permitting its almost entire construction of common red brick.

A single detailed account of the longest and largest variety of calciner in common use will serve as a model for all smaller specimens of the same class.

The principal variable dimension of a copper desulphurizing furnace is its length, as, for economical reasons, its width should always be as great as is compatible with convenient manipulation. Experience has placed this limit at 16 feet for the inside measurement of the hearth, nor should this dimension be lessened without good and sufficient reasons.

The length of the hearth is limited chiefly by the capacity of the ore to generate heat during its oxidation, the immediate influence of the fire-place being seldom capable of maintaining the requisite temperature upon a hearth over 16 feet in length, without resorting to the use of a forced blast, or of a draught so powerful as greatly to increase the loss in dust as well as the consumption of fuel.

The importance of the heat generated by the oxidation of sulphides in maintaining a proper temperature, and especially in conveying the heat to a great distance from the initial point, is seldom fully realized. Its intensity and durability depend upon the percentage of sulphur in the ore, and also not a little upon the manner in which it is chemically combined, the bisulphides—such as iron pyrites—furnishing a much greater amount of heat than monosulphides containing an equal gross amount of sulphur.

An ore carrying less than 10 per cent of sulphur will not furnish sufficient heat to warrant the addition of a second hearth to the first 16 feet, which will be assumed as the normal length of a single hearth. (Such a condition would scarcely occur in practice, as, under ordinary circumstances, any copper ore containing such a low percentage of sulphur would be smelted raw.) An increase of sulphur to 15 per cent, however, will be sufficient to heat the second hearth, while a 20 per cent sulphur ore should work rapidly in a three-hearth furnace. The addition of a fourth and final section is rendered justifiable by the increase of the average sulphur contents of the ore to 25 per cent, and even a 20 per cent bisulphide charge may be worked to advantage in the same.

The adoption of this method of roasting, by which the ore is fed into one end of the furnace, and gradually moved to the other extremity before discharging, is attended with several obvious advantages; among which are: The gradual elevation of temperature from a point compatible with the easy fusibility of the unaltered sulphides to that degree necessary for the complete decomposition of the pertinacious basic sulphates of copper and zinc; the great saving in fuel effected by thus obtaining the full benefit of the heat generated in the process of roasting itself; the certainty that the charge must undergo a certain number of thorough stirrings and turnings in its transportation over so extended a space; the establishment of a fixed duty, which must be performed by the workmen, whose labor can thus be much more easily controlled than with the single-hearth type of calciner, where the attendants can easily substitute an idle scratching for the vigorous manipulation necessary to move the ore forward promptly; a great simplification in firing, it being only necessary in the long furnace to maintain an even, high temperature, while with the single hearth, much experience and judgment

are required to adapt the heat to the ever-varying condition of the charge; lastly, a decided economy in construction, the ratio of fire-brick to common red brick for an equal capacity of plant being much less in the employment of long furnaces.

As there seems to be almost no limit to the extent of surface over which the requisite temperature may be obtained in the calcination of highly sulphureted ores, it is very natural that experiments should have been made with still longer furnaces than any yet mentioned, 120 feet being the extreme inside length yet attempted, so far as known to the writer; but careful and repeated trials have shown beyond a doubt that no sufficient advantage is reaped to repay the increased cost of the inclosing building and other expenses of plant. It is not possible for two attendants properly to manage a furnace having more than four full-sized hearths, if the latter is pushed to its full capacity, while the addition of a fifth hearth demands a third laborer, whose time, however, will not be fully occupied, while a sixth hearth will overtax the three workmen. In short, the testimony of many excellent metallurgists, to which the author can add his own experience, unequivocally condemns the lengthening of ordinary calcining-furnaces beyond the limits above indicated, excepting under special and peculiar conditions.

The number of working-doors to a long calcining-furnace, where the ore is moved from rear to front, should be as few as possible. The limit for comfortable work should not exceed eight feet between centers of doors, and any distance less than six feet is a decided disadvantage.

The sides of the working-door frames should have short lugs, not exceeding six inches in length, cast on them, in order that they may be firmly held in position by the buckstaves, which are placed in pairs for this purpose, a single buckstaff being placed in the center of the space between each pair. The bottom of the door-frames should be on a level with the hearth surface, which should be three feet above the floor grade of the building, which should slope gradually upward toward the rear of the furnace, to correspond with the increased height of each succeeding hearth.

The common practice of filling up the portions of the hearth between the working-doors with projecting, triangular masses of brick-work can not be recommended, as valuable space is often sacrificed in this manner. Slight projections, as shown in the cut to be given next week, may be built to fill the absolutely inaccessible angles; but with properly constructed door-frames, and careful manipulation on the part of the roasting attendants, but little waste area should exist, and this will soon regulate itself by becoming filled with ore, which may remain there permanently. This refers, of course, to the treatment of large quantities of low-grade ores, where the slight inaccuracies resulting from the practice indicated can do no harm.

After raising the side walls to the height required by the iron door-frames, usually about ten inches above the hearth level, the skewback for the main arch should be laid. This applies to the entire furnace from the beginning of the fire-box to the extremity of the rear hearth, and is a very simple matter, especially if the arch is to be perfectly horizontal, as is to be recommended in most cases. A taut line should be stretched, to insure accurate work, and if red brick are used, they should be cut on one long edge, being laid, of course, longitudinally and on the flat. They should be cut at an angle slightly greater than required by the curve of the arch, which should rise about three quarters of an inch to the foot, making a sixteen-foot arch twelve inches higher in the center than at the sides. This rise, though less than is often recommended, will be found ample to insure perfect safety and durability, and will tend to spread the flame and heat toward the sides of the hearth.

If so-called "side skewback" fire-brick are within reach, they should be used in place of the red brick, saving much cutting and insuring a better job. Three rows, in height, of red brick, or two of fire-brick, will give a solid bearing, the total number required for a furnace of the size under consideration being respectively 600 and 375.

It is of sufficient importance to bear repetition, that all portions of the mason work above the hearth line, or wherever exposed to heat, must be laid in clay—common brick clay, tempered with sand, being quite good enough for all portions of the furnace—as fire-clay is usually expensive in the localities where copper ores abound.

Lime mortar, much improved by the admixture of a little of certain cements—say 10 per cent—may be advantageously employed for the outside work, and wherever there is no danger of heat, as it makes hand-somer and stronger work, and is greatly preferred by the masons, who require constant supervision to compel them to use clay mortar where it is necessary. (TO BE CONTINUED).

Toughened Glass Beakers.—Experiments on toughened glass beakers in the laboratory, as detailed in the *Chemical News*, July 3d, condemn them. Within eleven months, out of twenty experiments, 2 burst spontaneously, 1 broke with hot water, 6 became useless from fissures and enfoliation, 3 broke by unknown means, and 8 were still in good condition.

The Projected Tower of Paris.—Besides the gigantic tower that M. Eiffel proposes to erect for the Paris Exhibition of 1889, the center of civilization is to have another great tower, which is to be used for scientific purposes. M. J. Bourdais has presented to the French Society of Civil Engineers a project for the erection of a masonry tower 984 feet in height. After an examination of the different geometric profiles realizable, M. Bourdais has adopted the column as being more apt than any other form to satisfy the rules of aesthetics, and also as being the most stable. In fact, the highest chimney in the world—that of St. Rollox, near Glasgow, 433 feet in height—has been submitted to numerous storms without suffering from them, and as other chimneys exposed to great wind pressure have never given rise to any accident, it would seem that a cylindrical form is one that should be adopted. M. Bourdais's structure would consist of a base 216 feet high, in which is to be established a permanent museum of electricity. Above this would rise a six-storied column, surmounted by a roof, forming a promenade and capable of accommodating 2000 persons. The central granite core, 60 feet in diameter, would be surrounded with an ornamental framework of iron faced with copper. This would be divided into six stories, each containing sixteen rooms, 16 feet in height and 50 feet square, designed for aërotherapeutic treatment.

* Copy-right, 1885, by the Scientific Publishing Company.

THE COWLES ELECTRIC SMELTING PROCESS.

The use of electricity in the reduction of metals from their ores is extending so rapidly, and the methods of its generation and application have been so greatly improved within a few years, that the possibility of its becoming the chief agent in the metallurgy of the future may now be admitted, even in cases where the present cost of treatment is too high to be commercially advantageous.

The refining of copper and the separation of copper, gold, and silver by electrolysis have thus far attracted the greatest amount of attention, but a commercial success has also been achieved in the dry reduction by electricity of some of the more valuable metals by the Cowles Electric Smelting and Aluminium Company, of Cleveland, Ohio. Both this method of manufacture and the qualities of the products are so interesting and important that it is with pleasure we call attention to them as steps toward that large and cheap production of aluminium that the abundance of its ores and the importance of its physical properties have for several years made the unattained goal of many skillful metallurgists.

The Messrs. Cowles have succeeded in greatly reducing the market value of aluminium and its alloys, and thereby vastly extending its uses, and they are now by far the largest producers in the world of these important products. As described in their patents, the Cowles process consists essentially in the use for metallurgical purposes of a body of granular material of high resistance or low conductivity interposed within the circuit in such a manner as to form a continuous and unbroken part of the same which granular body, by reason of its resistance, is made incandescent and generates all the heat required. The ore or light material to be reduced—as, for example, the hydrated oxide of aluminium, alum, chloride of sodium, oxide of calcium, or sulphate of strontium—is usually mixed with the body of granular resistance material, and is thus brought directly in contact with the heat at the points of generation, at the same time the heat is distributed through the mass of granular material, being generated by the resistance of all the granules, and is not localized at one point or along a single line. The material best adapted for this purpose is electric light carbon, as it possesses the necessary amount of electrical resistance, and is capable of enduring any known degree of heat when protected from oxygen without disintegrating or fusing; but crystalline silicon or other equivalent of carbon can be employed for the same purpose. This is pulverized or granulated, the degree of granulation depending upon the size of the furnace. Coarse granulated carbon works better than finely pulverized carbon and gives more even results. The electrical energy is more evenly distributed, and the current can not so readily form a path of highest temperature, and consequently of least resistance through the mass along which the entire current or the bulk of the current can pass. The operation must necessarily be conducted within an air-tight chamber or in a non-oxidizing atmosphere, as otherwise the carbon will be consumed and act as fuel. The carbon acts as a deoxidizing agent for the ore or metalliferous material treated, and to this extent it is consumed, but otherwise than from this cause, it remains unimpaired.

Fig. I. of the accompanying drawings is a vertical longitudinal section through a retort designed for the reduction of zinc ore, according to our process, and Fig. II. is a front elevation of the same. Fig. III. is a perspective view of a furnace adapted to withstand a very high temperature, and Figs. IV. and V. are respectively longitudinal and transverse sections of the same.

This retort consists of a cylinder *A*, made of silica or other non-conducting material, suitably imbedded in a body *B*, of powdered charcoal, mineral wool, or of some other material which is not a good conductor of heat. The rear end of the retort-cylinder is closed by means of a carbon plate *C*, which plate forms the positive electrode, and with this plate the positive wire of the electric circuit is connected. The outer end of the retort is closed by means of an inverted graphite crucible *D*, to which the negative wire of the electric circuit is attached. The graphite crucible serves as a plug for closing the end of the retort. It also forms a condensing-chamber for the zinc fumes, and it also constitutes the negative electrode. The term "electrode" is used in this case as designating the terminals of the circuit proper, or that portion of it which acts simply as an electrical conductor, and not with the intention of indicating the ends of a line between which there is no circuit connection. The circuit between the "electrodes," so-called, is continuous, being established by means of and through the body of broken carbon contained in the retort *A*. There is no deposit made on either plate of the decomposed constituents of the material reduced. The mouth of the crucible is closed with a luting of clay, or otherwise, and the opening *d*, made in the upper side of the crucible, near its extremity, comes entirely within the retort, and forms a passage for the zinc fumes from the retort-chamber into the condensing-chamber. The pipe *E* serves as a vent for the condensing-chamber. The zinc ore is mixed with pulverized or granular carbon, and the retort charged nearly full through the front end with the mixture, the plug *D* being removed for this purpose.

A small space is left at the top, as shown. After the plug has been inserted and the joint properly luted, the electric circuit is closed and the current allowed to pass through the retort, traversing its entire length through the body of mixed ore and carbon. The carbon constituents of the mass become incandescent, generating a very high degree of heat, and being in direct contact with the ore, the latter is rapidly and effectually reduced and distilled. The heat evolved reduces the ore and distills the zinc, and the zinc fumes are condensed in the condensing-chamber, precisely as in the present method of zinc-making, with this important exception, that, aside from the reaction produced by heating carbon in the presence of zinc oxide, the electric current, in passing through the zinc oxide, has a decomposing and disintegrating action upon it, not unlike the effect produced by an electric current in a solution. This action accelerates the reduction and promotes economy in the process.

Another form of furnace is illustrated by Fig. III., which is a perspective view of a furnace adapted for the reduction of ores and salts of non-volatile metals and similar chemical compounds. Figs. IV. and V. are longitudinal and transverse sections, respectively, through the same, illustrating the manner of packing and charging the furnace.

The walls and floor *L L'* of the furnace are made of fire-bricks, and do

not necessarily have to be very thick or strong, the heat to which they are subjected not being excessive. The carbon plates are smaller than the cross-section of the box, as shown, and the spaces between them and the end walls are packed with fine charcoal.

The furnace is covered with a removable slab of fire-clay *N*, which is provided with one or more vents *n*, for the escaping gases.

The space between the carbon plates constitutes the working part of the furnace. This is lined on the bottom and sides with a packing of fine charcoal *O*, or such other material as is both a poor conductor of heat and electricity—as, for example, in some cases, silica or pulverized corundum or well-burned lime—and the charge *P* of ore and broken, granular, or pulverized carbon occupies the center of the box, extending between the carbon plates. A layer of granular charcoal *O* also covers the charge on top. The protection afforded by the charcoal jacket, as regards the heat, is so complete that with the covering-slab removed, the hand can be held within a few inches of the exposed charcoal jacket; but with the top covering of charcoal also removed and the core exposed, the hand can not be held within several feet. The charcoal packing behind the carbon plates is required to confine the heat and to protect them from combustion.

With this furnace, aluminium can be reduced directly from its ores, and chemical compounds from corundum, cryolite, clay, etc., and silicon, boron, calcium, manganese, magnesium, and other metals are in like manner obtained from their ores and compounds. The reduction of ores according to this process, can be practiced, if circumstances require it, without any built furnace.

At present, the Cowles Company is engaged mostly in the producing of aluminium bronze and aluminium silver and silicon bronze. The plant, were it run to its full capacity, is capable of turning out eighty pounds of aluminium bronze, containing 10 per cent of aluminium, daily; or, it were to run upon silicon bronze, could turn out one hundred and twenty pounds of that per day, or, we believe, more aluminium bronze daily than can be produced by all other plants in the world combined. This production, however, is but that of the experimental laboratory, and arrangements are making to turn out a ton of bronze daily, and the works have an ultimate capacity of from eight to ten thousand horsepower. The energy consumed by the reduction of the ore is almost entirely electrical, only enough carbon being used to unite with the oxygen of the ore to carry it out of the furnace in the form of the carbon monoxide, the aluminium remaining behind. Consequently, the plant necessary to produce aluminium on a large scale involves a large number of the most powerful dynamos. These are to be driven by water-power or natural gas and marine engines of great capacity.

The retail price of standard 10 per cent aluminium bronze is \$1 per pound avoirdupois, which means less than \$9 per pound for aluminium, the lowest price at which it has ever been sold, yet the Cowles Company has laid a proposition before the government to furnish this same bronze in large quantities at very much lower prices than this. The Hercules alloy, castings of which will stand over 100,000 pounds to the square inch tensile strain, sells at 75c. a pound, and is also offered the government or other large consumers at a heavy discount. The alloys are guaranteed to contain exactly what is advertised; they are standardized into 10 per cent, 7.5 per cent, 5 per cent, and 2.5 per cent aluminium bronze before shipment.

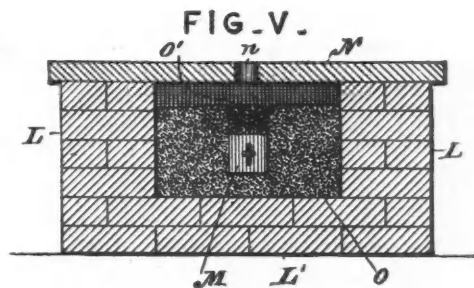
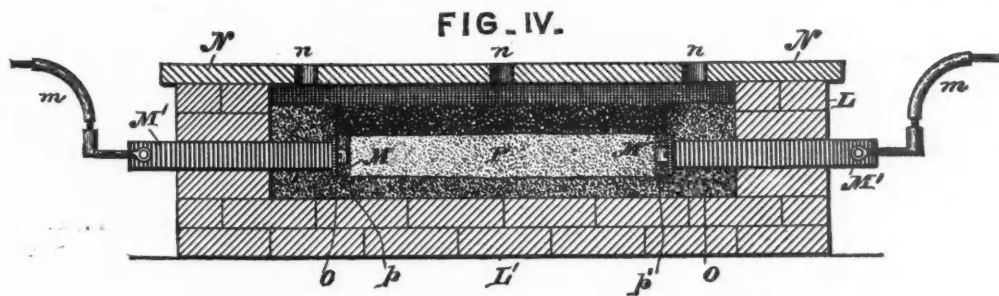
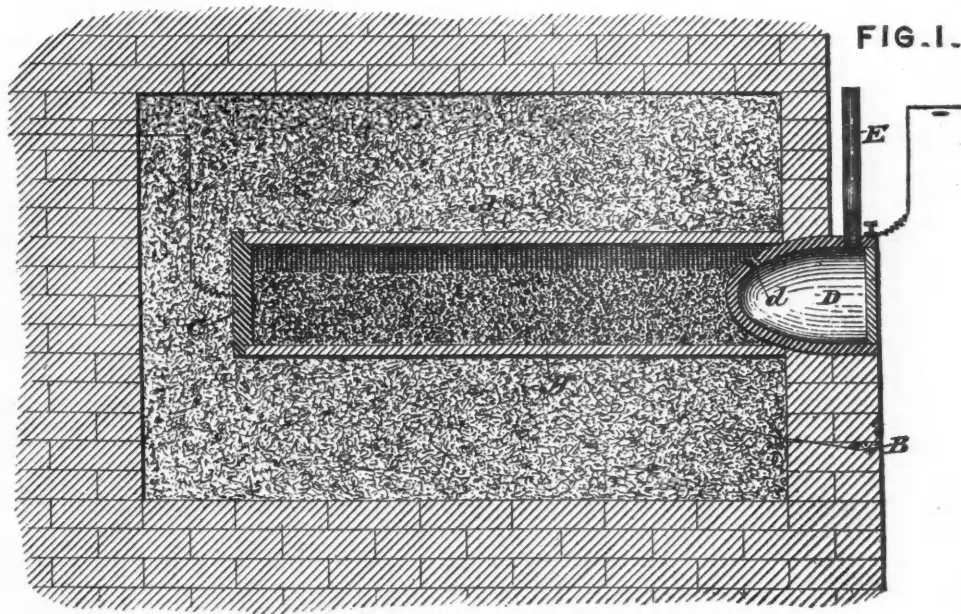
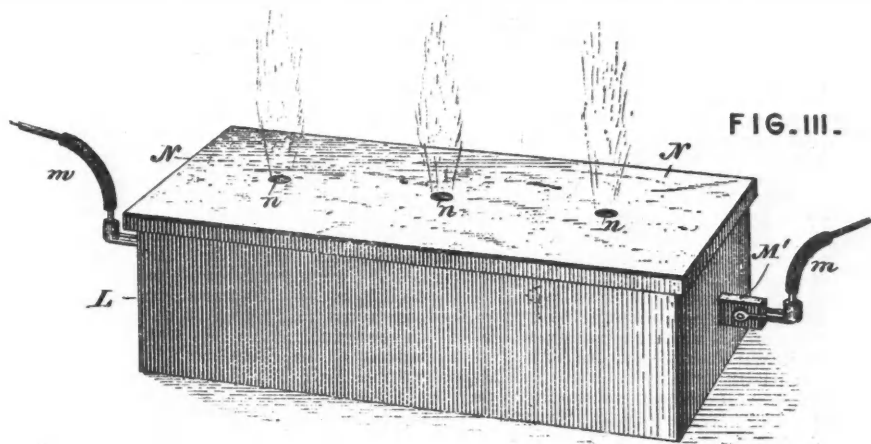
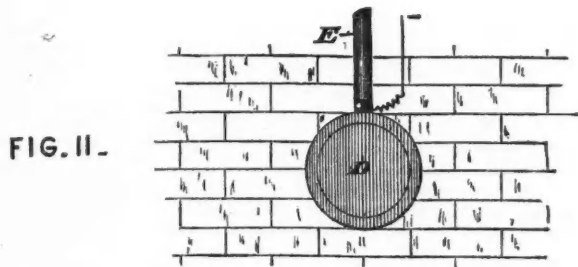
The current available at the Cowles Company's works was, until recently, 330 amperes, driven by an electro-motive force of 110 volts and supplied by two Edison dynamos; but the company has now added a large Brush machine that has a current of 560 amperes and 52 volts electro-motive force. We shall, on another occasion, give some particulars of experiments in the reduction of refractory ores by this process.

THE CASSEL ELECTRO-CHLORINATION OF GOLD ORES.

Disjointed and wholly absurd or incomprehensible so-called descriptions of the Cassel process for treating gold ores have appeared in our exchanges for some time past; and we have referred to the process, though with no comment. The accompanying description, taken from our London exchanges, though far from satisfactory, yet gives a fair idea of the electro-chlorination treatment by which it is claimed the gold is dissolved from raw pyrites and precipitated by electricity. The extraction of the gold, if, as stated, 91 per cent of the assay value of, presumably, rich concentrates, is less perfect than can be obtained by the simple chlorination of roasted ore in the Mears revolving barrel, or even by the ordinary Plattner chlorination; but in some cases there would be a saving in not having to roast the ore, and especially in cases where the roasting is difficult, as in that of antimonial pyrites.

We hope before long to be able to lay before the readers of the ENGINEERING AND MINING JOURNAL some more specific information than is here given, and some figures that will enable them to judge of the cost of treatment by this new and ingenious process.

Several tons of antimonial gold concentrates were treated that had been obtained from Mr. Andrew McIlwraith's mines in Queensland. According to the assay of Messrs. Johnson, Matthey & Co., it showed that by the Cassel process 91 per cent of the gold was extracted. The process is purely one of chlorination. Common salt solution, or sea water, and lime are the only substances used. Instead of the free gas being separately generated in the ordinary and costly way, the chlorine is evolved in the apparatus in the nascent state in contact with the ore, in which condition it has an immensely greater combining capacity for gold. At the same time, nascent oxygen is also generated, which, oxidizing the sulphides, arsenides, etc., liberates the gold, the nascent chlorine at once converting it into a terchloride. A secondary reaction here takes place, and hydrochlorous acid is formed, which oxidizes the pyrites; hydrochloric acid is also formed, which attacks any iron present, and forming a protosalt of that metal, this soluble iron compound precipitates the gold as fast as the chlorine brings it into solution, and thus prevents its extraction. Mr. Cassel, recognizing, after many experiments, the complicated nature of the above reaction, which so puzzled his predecessors, and being the first to point it out, has at length devised means whereby the iron compounds, which are invariably present in refractory ores, are retained in their insoluble form while under treat-



THE COWLES ELECTRIC SMELTING PROCESS.

ment, and thus are prevented from exercising any influence upon the solution of gold. This he accomplishes by the addition of caustic lime to the mixture of crushed ore and salt, which earth, by reason of its alkaline properties, at once combines with any hydrochloric acid, as fast as the latter is formed, and completely neutralizes it, so that no iron can be taken up. At the same time, a hypochlorite of lime is formed, which again, being decomposed by the action of the water present, affords additional nascent chlorine for the gold; the ultimate products of the reaction being chloride of sodium in excess, chloride of calcium, trichloride of gold, and undecomposed gangue at the anode, and chloride of sodium and sodium hydrate at the cathode.

Various forms of apparatus were shown and explained by the inventor and by Dr. Atcherley and Dr. Leipmann, who assisted in conducting the operations. The apparatus most approved of, and giving the most satisfactory results, looks very much like the well-known Freiberg amalgamating barrel. It consists of a large drum, containing a charge of 2½ tons, inside of which are arranged a number of carbon rods; these rods form the anode or positive poles, and are metallically connected with the corresponding pole of a dynamo, while the other pole of the dynamo is connected with the hollow iron shaft of the drum, which serves both as axis to the drum and also as negative pole of the apparatus. This shaft terminates through stuffing-boxes in hollow standards or tanks, where finally the gold accumulates. The drum is charged with the ores and salt water added thereto, and then set in motion by suitable gearing at a speed of about eight revolutions a minute. The current is then passed through it, decomposing the salt water, and nascent chlorine and oxygen are evolved at

the anode. By the revolution of the drum, the ores are constantly brought in contact with the carbons, where both these elements are generated, and the metals are readily dissolved. The adding of the lime neutralizes the acid as soon as formed, and thus prevents the formation of iron salts, and precipitates those already formed. Into the hollow shaft are bored a number of holes, and the shaft itself is covered with asbestos, which, while preventing the gangue from entering the shaft, allows the liquefied gold to penetrate through the cloth. After the addition of lime, which precipitates all other metals present except gold, the latter metal is rapidly dissolved and deposited by the electrical action in the interior of the pipe in a finely divided metallic state, and is carried thence into the hollow standards by means of an Archimedean screw fixed in the pipe. These standards are provided with movable doors, from which the gold slime is from time to time taken, dried off, and smelted.

Mild Steel Railroad Ties.—It is stated that, on the lines of the Dutch State Railroad Company, large quantities of mild steel ties of a new design have been introduced this year, the sleepers being obtained by a method of rolling that is quite new. The company having tried for many years different types of iron and steel ties in comparison with wood, the result of these trials is the adoption of this improvement. The sleepers designed by Mr. Post, engineer of permanent way of the company, are rolled with variable section, and coming from the rolls the ties have, first, the tilt 1 in 20 where the rails are fixed, and secondly, a thickening of the section in the most exposed part. This improvement is considered a great success, trial lengths laid having given complete satisfaction.

THE MANUFACTURE OF OXYGEN.

The chemical wonder of the London Inventions Exhibition, the manufacture of oxygen by the process of Brin Frères, is thus described: They have made what is really an artificial mineral lung of anhydrous oxide of barium, and with this, by an ingenious process, they simply take up the oxygen from the atmospheric air. They decompose the air, so to speak, and absolutely do what they like with it. First, the air is drawn by means of a partial vacuum through a vessel of quicklime, which absorbs all the carbonic acid and moisture, and reduces it to a mixture of oxygen and nitrogen. These gases are then drawn into the retorts heated at 500 degrees, and the artificial lung absorbs the oxygen, while the nitrogen is drawn off to a gasometer for conversion into ammonia, etc. The novelty is in the manufacture of the artificial lung. The Brins for the first time have made this indestructible. The use of baryta for the purpose is not unknown, but hitherto the baryta has been perishable and has required renewal every twenty-four hours at great expense. They make it virtually indestructible and unchangeable. In this way, they claim to have effected an absolute revolution in chemistry; for with a lung for the machine and the atmospheric air for the material, they can make just as much oxygen as they like, and the uses of this fluid, present and prospective, are almost innumerable and incalculable. The doctors would be very glad to have it for purposes of inhalation, only as it has been hitherto made from chlorine, it contains a trace of that poison, and is therefore a perilous thing to play with. We are now to have, according to the inventors, oxygen not only for the sick-chamber, but for the purification of ordinary dwelling-houses, and especially of theaters and public halls. It is simply to be turned on into a vitiated atmosphere like a stream of fresh air. Then the oxygen is forced into water to make a new table beverage of the most refreshing and invigorating kind, aerated without the slow poison of carbonic acid. It is to burn with gas or lamp light, and make a flame that is to rival electricity in brightness and brilliancy, and altogether surpasses it in cheapness, besides being the one light in the world that shows all colors at their absolute daylight value. In metal lurgy, it is to produce nothing short of a revolution, as it will feed a fire up to the highest temperature known. In another of its uses, dissolved in water, it is to effect much the same revolution in the bleaching trade. The nitrogen, which was at first looked upon as a waste product incidental to the manufacture of oxygen, is now, by a process due to the ingenuity of the same inventors, to be turned into ammoniacal salts for manure. Most of the uses of these products were formerly known; but this invention, if we are to believe what is claimed for it, tends to make them universal by an almost fabulous reduction in the cost of production. The chemical text-books, according to Messrs. Brin, are at fault as to the possibilities of baryta. They all teach that it is destructible; and the Brins maintain that, as they know how to treat it, it is indestructible. That is the essence of their invention, and according to them the failure to discover the secret accounts for the fact that so many men of science, beginning with Priestley and Lavoisier, have vainly tried to extract oxygen from atmospheric air. Their efforts have been persistent in proportion to the magnitude of the reward in view. Oxygen in large quantities means a revolution in half the processes of chemical industries.

MAGNESITE BRICKS.

A new substance for lining furnaces is, says *London Iron*, in course of introduction in England, by Messrs. Zeitz & Co., Sheffield, who are the agents for its sale in England. This is the material known as magnesite, of which large deposits have recently been discovered in Styria, Austria. It is well known that no material is so well adapted for furnace-lining, for durability and fire-resisting properties, as magnesite. The composition of the material is approximately as follows: Carbonaceous magnesia, from 90.30 to 97.32 per cent; carbonaceous limestone, from 0.05 to 0.61 per cent; argillaceous earth, 1.40 per cent; iron oxide, 4.49 per cent; insoluble residuum, 3.73 per cent. This residuum is found to consist of—Silicic acid, 0.93 per cent; argillaceous earth, 0.21 per cent; iron oxide, 0.18 per cent; magnesia, 2.41 per cent. Magnesite, after being dead-burnt, is chiefly employed in the form of magnesia stone for furnace-bottoms, and already a considerable trade has sprung up for this and other purposes. The first experiments with dead-burnt magnesite and magnesia stone were made at a large steel-works in Poland, where previously the operation of steel manufacture had been carried on by the Siemens-Martin system with acid bottoms and linings and arches of Dinas stone. The furnaces were charged and tapped twice in twenty-four hours. The acid lining, however, was not sufficiently proof against the heat and the chemical action set up in the furnace; for in a short time the bottoms and arches became completely melted, and a thorough reparation was needed every fortnight or three weeks. It was subsequently decided to adopt the dephosphorization process, and dolomite was employed for the furnace-bottoms, the side walls and arches being still lined with acid material. As, however, these last-named parts were still exposed to the most intense heat, tiles of dolomite were added as a protection. A difficulty then arose as to how to separate the Dinas stone of the arch from the dolomite tiles of the side walls; for if the two remained in contact, they would melt and run together. As an isolating substance, graphite and bauxite tiles were tried, but eventually abandoned in favor of tiles of magnesia. The extraordinary durability and refractory qualities of this course of magnesia isolating-tiles speedily led to the adoption of the material for the lining of the side walls, for the formation of the bottom of the furnace, and eventually for the covering of the arch of the Martin furnace as well. The results have proved completely satisfactory. The furnaces, we are informed, can now be worked three turns in twenty-four hours, and continuously for six or seven months. Moreover, so powerful is the magnesite that iron containing as much as 3 per cent of phosphorus can be effectually treated, the material turned out being quite equal to the best Swedish steel. The method of the Polish works has been adopted by a number of well-known French, American, etc., steel manufactories, so that the demand for the crude stone as well as for the magnesite tiles is already assuming considerable proportions. The cost of working with magnesite tiles is given as follows: 10 tons of pig-iron at 43s., £21 10s.;

8 tons of Spanish ore at 16s., £2 8s.; ferromanganese, 16s.; cost of smelting, £12 10s.; total cost of 10 tons, £37 4s. This operation yields 10½ tons of ingots, at a cost of £3 12s. 7d. per ton. In England, where pig-iron and Spanish ore are much cheaper than in Poland, the cost would naturally be much less than that shown above. The employment of magnesia stone is not, however, confined to the steel industry. Cement manufacturers and zinc-smelters are beginning to appreciate its splendid refractory qualities, while in lead smelting, quicksilver reduction, crucible construction, etc., its utility has been proved beyond doubt.

MISSOURI STEEL TO THE MAHONING VALLEY; OR, "COALS TO NEWCASTLE."

Special Correspondence of the Engineering and Mining Journal.

Among the many astonishing trade movements of this unrestful day, none is more surprising than the accomplished fact of a syndicate of Youngstown manufacturers leasing the plant of an insolvent steel concern in St. Louis, for the avowed purpose of making steel slabs and billets at that point, and transporting them to the Mahoning Valley for ultimate treatment.

The parties concerned in this novel enterprise have the reputation of being long-headed, shrewd business men. Certainly they have been long enough in the business, through "up and down" years, to know how to figure. The "grocers and bakers and candlestick makers" who in the past have built mills and furnaces have generally had their figures made for them, and, starting out with the assumption that "figures never lie," have found out before they got through, or before the sheriff and their creditors got through with them, that somehow or other the figures presented them at the outset were abominably inaccurate. But surely, in this case, no mistake could have been made. Richard Brown, and the Wicks and Bonnells, and the Andrews Brothers, don't make mistakes, if they can help it.

They find themselves confronted with a new condition of things in their business. They have to turn to steel or shut up their mills. They acknowledge that they have had no experience in steel making, and to put up the necessary plant is a costly undertaking to experimenters. They wisely conclude that it is much better to experiment on other people's money, so that if they don't succeed they won't lose much, and in any event they gain a valuable insight into a new business, and hereafter can form their plans with confidence.

They go to St. Louis—1st. Because they get a plant ready for operation for \$50,000 a year, and can hold this for six years if they want to. While the plant has been standing, it has been carefully tended and kept in good condition. There are two available furnaces, one 19½ feet by 72 feet and the other 16 feet by 60 feet; two 7-ton converters, and a mill that has turned out 450 tons of finished rails a day.

2d. Because they are within seventy miles by rail of unlimited quantities of Bessemer ores of the very highest grade. The ores of Pilot Knob, by reason of their extremely low phosphorus, are so well recognized as to value that they are largely brought by rail to Ohio and Western Pennsylvania for mixture with Lake Superior ores. All-rail Connellsville coke can be laid down in St. Louis at say \$4.80 a ton. Limestone is in immediate proximity, and, while it is difficult to get at the exact contract price for the ore, the parties interested state with great positiveness that they can make the steel and ship it to Youngstown at a lower cost than it can be made there. Coal for heating and steam purposes is as cheap there as in the valley. Contracts for transportation, both of raw materials and finished product, were made before the lease was closed.

It is asserted that a home market exists for about half the product, and the remainder will be consumed in the works of the parties in interest.

The capital of the company is stated at \$150,000. The permanent organization has not yet been effected.

The manager selected for the works is Mr. E. L. Goldstein. Thoroughly educated in both German and French technical schools, he came to this country about the beginning of the war. Thrown upon his own resources, and beginning as a coal-heaver on a government vessel, he left the service an engineer. For twelve years or more, he was in the employ of the Cambria Iron Company, and was the chief assistant on the St. Louis works at the time of their failure.

Qualified by long experience, and keeping abreast of all the progress of the day, competent men would seem to be in charge of the practical department of the enterprise. One thing is certain, the success of this undertaking signifies the dawn of a new industrial era for St. Louis and Missouri, and makes a new and most important steel center for the country. The progress of this scheme will be watched with eager interest by both friends and competitors.

VERITAS.

MINING AND MINERAL STATISTICS OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1884

The *Mining and Mineral Statistics of Great Britain and Ireland* have reached us a month earlier than last year. They are contained in a bulky quarto volume of 265 pages, and consist of the statistics of production, importation, and exportation of minerals and metals; of a list of mines and their owners and managers; and a statement of the number, sex, and age of those who are employed in and about the mines of the United Kingdom. As legislation looking to the safety of the miner from accidents has been made very stringent of late years, the tables and details of accidents and their causes are full and specific.

The great importance attached to mining in the United Kingdom is explained by the fact that 564,496 of the 35,250,000 inhabitants are employed in mining alone, or 1.6 per cent of the total population.

The depression in business does not appear to have affected the production and value as much as might have been anticipated.

The most noticeable falling off is in the alum minerals; but the increase in the production of salt contradicts the supposition that the chemical trade is in great straits, while the continued importation of pyrites, given in another table, proves that the ammonia process of making carbonate of soda has not generally displaced the old Leblanc method.

The coal mines produced nearly three million tons and the iron mines one million less in 1884 than in 1883; but the pottery interest, as shown by the production of clays, seems to have suffered but slightly,

THE MINERAL PRODUCE OF THE UNITED KINGDOM FOR 1883 AND 1884.

DESCRIPTION.	1883.				1884.			
	MINERALS RAISED.		METALS CONTAINED IN ORES.		MINERALS RAISED.		MINERALS OBTAINABLE IN SMELTING.	
	Quantity.	Value at mine.	Quantity.	Value at the average market price.	Quantity.	Value at mine.	Quantity.	Value at the average market price.
Alum clay (Bauxite).....	Statute tons. 13,478	£ 10,108	Statute tons.	£	Statute tons. 8,580	£ 4,280	Statute tons.	£
Alum shale.....	8,288	1,036	.....	.....	1,960	245	.....	.....
Antimony ore.....	.....	.....	.....	.....	4	40	.....	.....
Arsenic.....	7,822	53,513	.....	.....	7,905	57,841	.....	.....
Arsenical pyrites.....	1,300	1,092	.....	.....	1,762	1,143	.....	.....
Barytes.....	21,396	26,565	.....	.....	20,062	29,356	.....	.....
Bog iron ore.....	8,447	4,768	.....	.....	6,453	1,935	.....	.....
Clays (excepting ordinary clay).....	2,853,353	706,757	.....	.....	2,665,710	607,306	.....	.....
Coal.....	163,737,327	40,054,143	.....	.....	100,757,779	43,446,183	.....	.....
Cobalt and nickel ore.....	40	173	.....	.....	63	237	.....	.....
Copper ore.....	46,288	145,804	2,555	181,067	41,728	109,427	3,295	202,591
Copper precipitate.....	531	3,701	65	.....	421	3,186	55	.....
Fluor-spar.....	90	253	.....	.....	581	730	.....	.....
Gold ore.....	869	100	66 ounces.	252	.....	.....	.....	.....
Gypsum.....	99,551	43,215	.....	.....	109,922	45,441	.....	.....
Iron ore.....	17,383,046	5,122,331	6,189,815	16,093,520	16,137,887	4,463,275	5,626,644	13,644,612
Iron pyrites.....	27,672	17,467	.....	.....	29,164	18,139	.....	.....
Jet (incomplete).....cwt.	116	14	.....	.....	.....	.....	.....	.....
Lead ore.....	56,487	474,911	43,419	560,130	54,485	401,555	40,075	452,847
Manganese ore.....	1,287	2,976	.....	.....	909	1,439	.....	.....
Ocher, umber, etc.....	8,719	21,191	.....	.....	9,191	18,976	.....	.....
Oil shale.....	1,167,943	299,676	.....	.....	1,518,871	386,780	.....	.....
Phosphate of lime.....	49,580	101,729	.....	.....	51,866	103,976	.....	.....
Salt.....	2,325,720	669,760	.....	.....	2,332,704	678,343	.....	.....
Silver from lead ore.....	.....	.....	344,053 oz.	72,484	.....	.....	325,718 oz.	68,791
Slates and slabs.....	498,002	1,246,332	.....	.....	485,664	1,174,020	.....	.....
Stone, etc.....	Unknown.	8,798,542	.....	.....	Unknown.	8,850,854	.....	.....
Strontia.....	.....	.....	.....	.....	11,422	22,844	.....	.....
Tin ore.....	14,469	735,189	9,307	903,476	15,117	669,254	9,574	808,740
Wolfram.....	111	1,443	.....	.....	64	1,104	.....	.....
Zinc ore.....	29,728	92,895	13,603	218,328	25,563	74,029	9,910	152,835
Totals.....	.....	64,635,834	.....	18,029,250	.....	61,232,028	.....	15,331,416

Despite the low price of our petroleum prevailing during the past year, the production of oil-shale increased 12 per cent. The state of the artificial manure trade must not be judged by the small home production of 51,866 tons of phosphates, showing a gain of 2286 tons in 1884 over 1883, but by the importation of 219,225 tons given in another table, which shows a falling off of 27,720 tons. (TO BE CONTINUED.)

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price!]

Pocket-Book of Mechanics and Engineering. Containing a Memorandum of Facts and Connection of Practice and Theory. By John W. Nyström, C.E. Eighteenth Edition, Revised and Greatly Enlarged with Original Matter. Philadelphia: J. B. Lippincott Company. 1885. Small oblong 8vo, pages 671 (including Index). \$3.50.

Healthy Foundations for Houses. With 51 Illustrations. By Glenn Brown, Architect, Associate American Institute of Architects. "He who builds a fair house on an ill seat committeth himself to prison." Bacon. (Reprinted from the "Sanitary Engineer.") New York: D. Van Nostrand. 1885. 18mo, pages 143. Boards, 50 cents.

Stocks and Shares. A Guide for Investors and Speculators. With a Treatise upon the Infatuation and Danger of Stock Speculation. Omnibus hoc Vitium est. By the Author of "How to Operate Successfully on the London Stock Exchange." New York: Carroll Sprigg & Co., 2 Wall street. 1885. Square 8vo, pages 144. Cloth extra, 75 cents; popular edition, 50 cents; morocco, gilt edges, \$1.50.

Chapter I. Speculation. II. Stock exchanges. III. Brokers. IV. Bulls and bears. V. Puts and calls. VI. Pools, cliques, and syndicates. VII. Outsiders. VIII. The right time to buy and the right time to sell. IX. Operating for a turn. X. Rubbish. XI. Rules. XII. Reference tables. XIII. Finale.

A Manual of the Theory and Practice of Topographical Surveying by Means of the Transit and Stadia; including Secondary Base-Line and Triangular Measurements, and the Projection of Maps; accompanied by Reduction Tables and Diagrams, Plates of Map-Lettering, and Topographical Signs. By J. B. Johnson, C.E., Professor of Civil Engineering, Washington University; formerly Engineer on the United States Lake and Mississippi River Surveys. Designed for the Use of Students and Engineers in the Class-Room, Field, and Office. New York: John Wiley & Sons. 1885. 8vo, pages x+111+[2]. Frontispiece, Conventional Signs for Topographical Maps; 10 Wood-Cuts. \$1.25.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

GRANTED JUNE 2D, 1885.

318,952. Tool for Dressing Emery Wheels. Lewis Bush, Jr., Chicago, Ill., Assignor to the American Machinery Company, same place.

318,968. Duplex-Crank Piston-Pump. Josiah Dow, Lowell, Mass.

318,970. Chuck. Augustus E. Ellinwood, Akron, Ohio, Assignor of two thirds to Lewis Miller and Henry Young, both of same place.

318,972. Process of Making Ammonium Sulphate. Edward A. Fales, Indianapolis, Ind.

319,005. Fuel-Machine for Steam-Generators. George Mehring, Chicago, Ill.

319,009. Roll for Rolling Car-Rails. Arthur J. Moxham, Louisville, Ky.

319,010. Metal Cross Tie for Railroads. Arthur J. Moxham, Louisville, Ky.

319,045. Rock-Drill. Leander S. Woodbury, Calumet, Mich.

319,062. Hot-Air Furnace. Stephen T. Bryce, Dayton, Ohio.

319,093. Rotary Pump. Reuben F. Hassinger, Adamsburg, Pa.

319,118. Solution of Dichloride of Copper, etc., for Treating Ores. Abel Patchen, Westfield, New York.

319,144. Method of Utilizing Old Boiler-Tubes. Nathan Stephens, Brooklyn, and Matthew L. Ritchie, New York City, Assignors to the Eagle Tube Company, New York City.

319,180. Furnace for Preparing Artificial Fuel. Vincent Biétreix, St. Etienne, France.

319,202. Chuck for Rock-Drills, etc. James E. Denton, Hoboken, New Jersey.

319,228. Metal Roofing. Benedict Goodman, Auburn, Ind.

319,240. Binder for Roller-Couplings. Samuel M. Guss, Reading, Pa., Assignor of one half to Jacob S. Ammon, same place.

319,251. Speed-Governor for Steam-Engines. Ebenezer Hill, South Norwalk, Conn.

319,270. Apparatus for Cleaning the Residuum from Zinc-Retorts. William Lanyon and Robert H. Lanyon, Pittsburg, Kan.

319,297. Surface Drainage, with Special Reference to the Prevention of Floods. Antonio Montenegro, Madrid, Spain.

319,304. Implement for Molding and Necking Bullets. Thomas Oldham, Leipsic, Ind.

319,305. Angle-Iron. David O. Paige, Detroit, Mich.

319,308. Rock-Drill. A. Ingram Parsons, New York City.

319,364. Means for Detecting and Carrying off Leakage from Gas-Mains. George Westinghouse, Jr., Pittsburg, Pa.

319,365. Pipe-Line for Gas-Supply. George Westinghouse, Jr., Pittsburg, Pa.

319,413. Molding-Machine. James A. Horton, Reading, Mass.

319,423. Oscillating Engine. Douia C. Putnam, Wayne Center, New York.

GRANTED JUNE 9TH.

319,429. Pulverizing-Machine. Ryerson D. Gates and Charles Kaestner, Chicago, Ill.

319,486. Screen for Sizing Ores and other Substances. Cornelius Haywood, Chicago, Ill.

319,493. Centrifugal Machine. John Laidlaw, Glasgow, County of Lanark, Scotland.

319,502. Combined Drilling and Boring-Machine. George G. Morrison, Philadelphia, Pa.

319,515. Metal Mold for Casting Steel Wheels. William Sellers, Philadelphia, Pa.

319,520. Core-Bar. Frederick Shickle, St. Louis, Mo.

319,538. Piston-Head Packing for Rock-Drills. Leander S. Woodbury, Calumet, Mich.

319,559. Boiler-Tube Expander. Michael Cashin, San Francisco, Cal.

319,603. Metal Bending and Straightening Machine. Walter J. Muncester, Cumberland, Md., Assignor of one half to Merwin McKaig, same place.

319,610. Ore and Salt Drier. Robert A. Nevin, San Francisco, Cal.

319,614. Drill. John H. Pendleton, Brooklyn, New York, Assignor to himself, Alexander H. Tiers, and Cornelius Tiers, both of Madison, New Jersey; William G. Stephens, Chicago, Illinois, and Joseph B. Dickson, Morristown, New Jersey.

319,648. Wheel-Gearing for Rollers of Rolling-Mills. Friedrich Wegmann, Zurich, Switzerland.

319,653. Rock-Drill. De Volson Wood, Boonton, New Jersey.

319,654. Adjusting Device for Rolling-Mills. John Wood, Conshohocken, Pa.

319,657. Gold-Saving Apparatus. Victor P. Yelmini, Sutter Creek, Cal.

319,678. Hydraulic Valve for Elevators and other Apparatus. Charles R. Crane, Chicago, Ill., Assignor to Crane Brothers' Manufacturing Company, same place.

319,687. Process of Electro-Depositing Copper. Moses G. Farmer, New York City.

319,688. Glass-Furnace. David Fetters, Baltimore, Md.

319,693. Rolling-Mill Plant. William Garrett, Pittsburg, Pa.

319,694. Rolling-Mill Plant. William Garrett, Pittsburg, Pa.

319,713. Furnace for Annealing Metals. Edwin M. Herr, Denver, Colo., and George W. Cummins, Vienna, New Jersey.

319,741. Stone and Ore-Crusher. William A. Miles, Copake Iron-Works, New York.

319,751. Gauge for Cutter-Heads. Samuel J. Shimer, Milton, Pa.

319,752. Machine for Forging Car-Axles and other Metal Articles. George F. Simonds, Fitchburg, Mass.

319,754. Die for Forging Metal Articles Circular in Cross-Section. George F. Simonds, Fitchburg, Mass.

319,755. Method of Forging Metal Bars. George F. Simonds, Fitchburg, Mass.

319,756. Die for Spherical Articles. George F. Simonds, Fitchburg, Mass.

319,780. Machine for Forming Pottery and Glassware and Finishing or Turning the same. Cassius C. Thompson, East Liverpool, Ohio.

319,763. Middlings-Purifier Brush. John Wegman, Jr., Rochester, New York.

319,772. Machine for Stripping Metal. Henry S. Bacon, Milford, Assignor to the American Metallic Fastening Association, Boston, Mass.

319,779. Process of Casting Metal Ingots. Frank Billings, Cleveland, Ohio, and William R. Hinsdale, Brooklyn, New York.

319,780. Apparatus for Casting Metal Ingots. Frank Billings, Cleveland, Ohio.

319,785. Catcher and Drag-Out for Rolling-Mills. Harvey B. Chess, Pittsburg, Pa.

319,795. Process of Smelting Ores by the Electric Current. Eugene H. Cowles and Alfred H. Cowles, Cleveland, Ohio, Assignors, by Direct and Mesne Assignments, of four tenths to Edwin Cowles and Charles F. Mabery, both of same place.

319,828. Hot-Air Feeder for Furnaces. James W. Loveridge, Jersey City, New Jersey.

319,832. Roll for Metal Rods. William A. McCool, Perryville, Assignor of one half to Paul Oliver, Ashland County, Ohio.

319,857. Ore-Concentrator. Ellis W. Sinclair, Tombstone, Arizona.

319,879. Tube-Expander. William A. Bole, Pittsburg, Pa., Assignor of one half to Ralph Bagaley, same place.

319,921. Metallic Roofing. Levi H. Montross, Simcoe, Ontario, Canada.

319,926. Device for Handling Metal. William C. Nightengale, McKeesport, Assignor to James I. Kay, Pittsburg, Pa.

319,933. Cutter-Head. Samuel J. Shimer, Milton, Pa.

319,945. Electric Smelting-Furnace. Eugene H. Cowles and Alfred H. Cowles, Cleveland, Ohio.

FURNACE, MILL, AND FACTORY.

THE BARBED WIRE COMBINATION.—The committee appointed by the barbed wire manufacturers at their recent meeting at Chicago, Ill., to arrange the details of a proposed pool, has submitted its report. It recommended the organization of a national barbed wire fence company, with a capital stock of \$2,000,000, divided into 20,000 shares of \$100 each, the organization to be accomplished under a charter issued to a similar committee of manufacturers on December 27th, 1883. The proposed company will lease the works of the several members, and its officers and directors will have complete charge of the output as well as prices, the members being stockholders. The committee reported that it would be necessary to draught an agreement to be signed by the manufacturers before perfecting the proposed organization. To enable the committee to draught the instrument, the meeting adjourned until the end of this week. It is expected that all manufacturers of barbed wire in the United States will sign the agreement. The new company will probably be in operation September 1st.

The Hayes Steel Casting Company, of Chicago, has been incorporated to manufacture and sell castings of steel and of other metals under the Hayes patent casting process. Capital stock, \$150,000; incorporators, Martin Peter Hayes, James D. Watson, and Hubert M. Miller.

An explosion occurred at six o'clock A.M., on the 2d inst., at Balbach & Co.'s lead and bullion refinery, on the Morris Canal, just below Newark, by which two men were terribly burned. An investigation showed that the crown-sheet of the boiler had cracked and allowed a jet of water to run in on the old lead. If the explosion had occurred an hour later, the number of injured would have been large.

The estate of the St. Albans Iron and Steel-Works, Massachusetts, has been finally settled, and the assignees have been discharged. The only claim against the company now outstanding is the judgment of Mr. Remington, of Iliou, New York, for about \$10,000.

Proposals will be received by the War Department at Washington until August for one set oil-tempered and annealed forgings of open-hearth steel, of American production, of the physical properties and dimensions described in the specifications and drawings to be had upon application at the War Department.

The Midland blast-furnace in Crawford County, Mo., made 1203 tons of iron in June, and is still keeping up a maximum production. The Sligo, in Dent County, is reported working slowly, and will probably close down inside of two months. These are the only charcoal furnaces in the State in operation, and one of the two Missouri furnaces, in South St. Louis, is the only coke furnace active.

The Missouri Malleable Iron Company, at St. Louis, Mo., has closed down in all departments, and will probably not resume operations until the 1st of September.

A part of the extensive mills of Brown, Bonnell & Co., at Youngstown, Ohio, resumed operations on the 3d inst., the company having completed satisfactory arrangements with its men. The conditions of starting, as given by a scale committee man, are, that the firm will pay Pittsburg prices and not use old rails enough to come under the two third old rail clause.

The Garry Iron Roofing Company's works at Cleveland, Ohio, which were recently destroyed by fire, have been rebuilt and enlarged, and the company is now able to fill all orders promptly.

Messrs. J. P. Witherow, of Pittsburg, Pa., have just contracted to build a Clapp-Griffiths plant of two converters for the Paxton Rolling-Mill and the Harrisburg Nail-Works, at Harrisburg, Pa. The firm has also entered into a contract to supply a complete furnace plant for the York Iron Company, of Black River Falls, Wis., which is to be completed by January 1st, 1886.

The work of relining and repairing the furnace and works at Oxford Furnace, New Jersey, is progressing.

Proposals are asked for by the Rock Island Arsenal, Rock Island, Ill., until August 20th, for the following supplies: Blacksmith's tools, silver, gold, steel, tin, brass, iron, copper, and brass rivets and burs; iron, brass, and copper wire; nails, screws, tacks, bolts, nuts, oils, chemicals, tools, files, etc. A preference will be given to articles of domestic production and manufacture, conditions of prices and quality being equal.

The excellence of the Rand drills and compressors may be judged from the fact that there are 143 of

these drills in the Calumet & Hecla mines, and six of the Rand compressors, namely, two 28 inch by 48 inch, two 32 inch by 48 inch, and two 36 inch by 60 inch. The compressors are used for driving the drills and for running the hoisting-engines at the winzes, and occasionally for running pumps. Many of the other Lake Superior mines also use Rand drills and compressors.

The Clayton air-compressor works has issued a new illustrated catalogue and price-list. Every mine manager and engineer should have a copy for reference, for none can afford to be without the information there given concerning the unsurpassed Clayton compressor and the Clayton pumps, and other machinery. As perhaps one of the strongest testimonials to the excellence of the Clayton machinery, and as evidence of the fact that it has always kept up with the foremost, we may mention the fact that it has been advertised in the columns of the ENGINEERING AND MINING JOURNAL for twenty years, and has always been recognized as of excellent quality.

Mr. James Henderson states that some Boston capitalists have taken out licenses for his various steel processes, and are moving the furnace at Bellefonte, Pa., to Boston, where the processes will be used in it. They were induced to take this step upon the representations of the Messrs. Gogin, who were for ten years in charge of the steel-melting department of Naylor & Co., at Boston.

The Lookout Rolling-Mill, at Chattanooga, Tenn., after eighteen months' idleness, resumed on the 4th, with six months' orders ahead.

The rolling-mills of Niedinghaus Brothers, at St. Louis, Mo., which have been closed since May 1st, resumed operations this week.

LABOR AND WAGES.

The strike at the Joliet (Ill.) Rolling-Mills ended on the 3d inst., the blast-furnace men going to work at their former wages.

The tenth annual convention of the Amalgamated Association of Iron and Steel-Workers convened at Wheeling, West Va., on the 4th inst., President Weihe in the chair. Only eighty-six delegates were present, less than one half the attendance at the sessions of the three preceding years.

The miners representing the thirteen mines of the Massillon District of the Tuscarawas Valley, Ohio, met on the 4th inst. and decided to stand out for the old price of 75 cents a ton. This was done with the understanding that the Hocking Valley miners would within two weeks demand an advance from 40 to 60 cents.

The miners who have been mining coal in the shipping mines of the Hocking Valley, Ohio, at forty cents a ton in the past two months, have adopted resolutions to ask their employers for an advance of ten cents a ton.

The strike among the miners at the mines of Dayton Coal and Iron Company, Tenn., has assumed a serious aspect.

TRANSPORTATION NOTES.

American capitalists are building a railroad in San Domingo, which will run through its richest sections.

It is reported that the Southern Pacific Company is having a survey made, and has sent Engineer Gustave Cox out to survey and prepare estimates of the cost of running the necessary tunnels for the contemplated railroad from Wilcox, Arizona, to the Deer Creek or San Carlos coal-fields.

The Delaware & Hudson Canal Company reports that its leased lines for the quarter ended June 30th were operated at a loss of \$103,552 for the quarter. This is in excess of the loss made during the corresponding quarter of 1884 by \$5846.

COAL TRADE NOTES.

MANITOBA.

The line of railroad to the coal mines of the Northwest Coal Mining and Transportation Company on Belly River, will be completed in a few weeks, by which time the company will have 300 experienced coal miners at work to turn out coal. The machinery necessary for the proper working of the mine has been purchased, and is already on the works. If the demand for the coal is very large, the staff of miners will be increased, so that the output will meet the demand. Agents to sell coal will be appointed at all points along the Canadian Pacific Railroad. It is the intention of

the company to deliver coal to consumers in Winnipeg at \$8.50 a ton. The company has also an arrangement with this railroad to supply all the coal necessary for the operation of the western division. The Indian department and government in the Northwest will also be supplied with the coal. The delivery of coal will begin next month.

MARYLAND.

Reports show that during July 465 boats, carrying 51,030 tons of coal, left Cumberland on the canal. The revenue was about \$13,000. The month's tonnage was nearly double that of the corresponding month last year, and was the heaviest month so far this season, notwithstanding low water. The total shipments by canal for the season are 187,919 tons.

The rock heading in the Eckart slope, which was started some five months ago with four shifts of men working steadily every day, was driven through week before last. The new heading will give access to a large body of good coal that was abandoned many years ago, owing to a large body of water being in the way. Hitchins & Brother's new mine, near their old mill mine, is about ready for shipments.

OHIO.

The Southern Ohio Coal and Iron Company has reduced the capital stock from \$1,500,000 to \$500,000. The Patterson Coal Company, of Dayton, has changed its name to the Acme Coal Company.

PENNSYLVANIA.

ANTHRACITE.

The storm on the 3d inst. did damage to several of the collieries at Shenandoah, and they have been compelled to suspend work.

The new breaker for the Northwest Coal Company at Carbondale has begun operations. It has a capacity of about 350 tons a day.

BITUMINOUS.

The Mining Commissioners appointed to redistrict the bituminous coal region of Western Pennsylvania have finished their work. A new district was created, known as No. 7. The districts under the new organization will be as follows: District first has been changed so as to comprise that territory that includes Greene and Washington counties and that part of Westmoreland County west of the Youghiogheny River, and also that part of Fayette County along the Monongahela River. District second is now that part of Allegheny County east of the Allegheny, Monongahela, and Youghiogheny rivers, also Westmoreland except the mines along the West Penn Railroad and those on main line (Pennsylvania Railroad) east of Beauty's station. District third includes Lawrence and Armstrong counties and that part of Beaver north of the Ohio River, as well as that part of Westmoreland County along the West Penn Railroad, and also includes Mercer, Venango, Clarion, Forest, Warren, Crawford, and Erie counties. District seven, which was created, includes that part of Butler and Beaver counties south of the Ohio River and Allegheny west of the Allegheny, Monongahela, and Youghiogheny rivers.

A syndicate of capitalists of Pittsburg and in the coke regions, is arranging a plan by which it can take out the coal that underlies the Monongahela, Allegheny, and Youghiogheny rivers. In nosing about some old State documents recently, a coal man of Pittsburg discovered a charter eighteen years of age that gave exclusive right to all the minerals lying under the bed of the three rivers in Allegheny County to a company. Two of the members of that company were John Scott and Robert Mackey. In a number of places along the Monongahela River, the first vein of coal has been exhausted and shafts have been sunk to work the thicker vein. The right to take out the stratum under the river, then, has become of special value. The plan of the newly formed company is to begin operations this fall within the city limits of Pittsburg. In the neighborhood of the Point, shafts on each side of the river will be sunk to the vein. The two openings will then be dug toward each other until all the coal in the neighborhood has been taken out. Then shafts will be sunk in a similar manner farther up the river, and the plan repeated in this way until all the coal underlying the river-bed has been extracted. The nearness to the river will allow the coal to be loaded directly upon the barges.

COKE.

The coke syndicate on the 30th inst. ordered ten per cent more of the coke-ovens to blow out. This will leave only 50 per cent working. About 800 ovens will be cut off by the order. Repairing the ovens and

other necessary work will be done, which will extend through August, and possibly into September. Only about 500 cars a day are shipped.

TEXAS.

The discovery is reported of a bed of bituminous coal within three miles of Lampasas. Samples taken from the vein show a fine quality of coal, equal to the Indian Territory article. It is stated that a syndicate of local capitalists has already purchased the land, and will begin developing on an extensive scale.

GAS AND PETROLEUM NOTES.

Exports of refined, crude, and naphtha from the following ports, January 1st to August 1st:

	1885. Gallons.	1884. Gallons.
From Boston	5,385,664	3,262,709
Philadelphia	81,189,962	43,774,941
Baltimore	6,086,504	7,132,742
New York	208,917,935	219,599,298
Total exports	301,600,065	273,789,690

ILLINOIS.

While boring for water in the vicinity of Clinton, a vein of natural gas was struck at a depth of ninety feet. The quality has been demonstrated to be good. Steps are taking to utilize the discovery.

NEW YORK.

It is stated that mains are laying in Jamestown, and it is expected that in a few weeks natural gas will be used in the stoves and furnaces of that place.

PENNSYLVANIA.

The Champion Gas Company has leased 637 acres of gas land in the vicinity of the Duff well. The anticlinal belt from the Murraysville District passes through the company's territory.

The Connellsville Improvement Association has assumed a definite policy and taken steps to organize a company to put down a test well for natural gas. The authorized capital is \$5000.

The report that the Pennsylvania Fuel Company and the Fuel Gas Company, both of Pittsburg, had been consolidated, has been denied by Mr. Westinghouse.

A special dispatch states that the Philadelphia or Westinghouse Gas Company has purchased the Carpenter Natural Gas Company for half a million dollars. By this purchase, the Philadelphia Company secures the mineral right to 36,000 acres of gas territory in the center of the Murraysville District. The Carpenter line of pipes supplied 11 iron and glass manufactories in Pittsburg and McKeesport, Pa. It was the most active competitor of the Philadelphia Company, which is now virtually in control of the natural gas industries of the country. Its lines make a complete circuit of the city of Pittsburg.

The first gas for domestic purposes was introduced in Sharpsburg on the 1st inst. by the Westinghouse Company, and gave entire satisfaction. The rates charged at present are estimated on the number of fires and the cost of coal. This brings the price up to about 25 cents per 1000 feet, which parties who have been contemplating the use of the natural fuel consider entirely too high. Unless there should be a material reduction, it will no doubt be some time before the gas is in general use.

GENERAL MINING NEWS.

ARIZONA.

PIMA COUNTY—QUIJOTOA DISTRICT.

The Peerless Mining Company, of Quijotoa, will pay but \$3 a day for all employes engaged henceforth. Those miners at present employed will continue to receive \$4.

CALIFORNIA.

MULEGE MINING DISTRICT.

CONSOLIDATED REFORMA.—On this property, which is situated about fifteen miles north of the Providentia and in the same range, near the coast, a shaft is sinking which is developing a body of high-grade ore of gold and silver. Negotiations have been going on for some time between the Providentia Company and the Consolidated Reforma, and the proposition for the reduction of the ores of the latter company is, it is stated, practically completed.

PROVIDENTIA.—The French syndicate that recently purchased this mine is putting up reduction-works on a large scale. The syndicate has 10 furnaces of 30 tons capacity each, nearly completed, and calculates, when fairly in operation, to turn out over 500 tons of bullion a month.

CALAVERAS COUNTY.

ANGELS.—This mine, which is sometimes called the Potter Brown mine, has recently been purchased by Hon. James V. Coleman, and is now in charge of Charles N. Tozer. The mine has already yielded to its various owners large sums. Two shafts have been sunk into the newer and partially unworked ground, neither one of which is down a greater depth than 110 feet. It is proposed to sink and cross-cut, and if the prospects equal the expectations, a fifty and probably sixty-stamp mill will be erected in the fall. A compressor is already at work. The hoisting-works are now in course of construction, and the mine will be worked from both shafts at each end of the mine.

BECHTEL.—The shaft is down about 160 feet. The ore extracted is sufficient in quantity and value to keep a ten-stamp mill continually going, and to employ a large force.

GRAYSON & BORLAND.—The ore is very low grade, but the investment is said to pay handsomely, and the 40-stamp mill is never idle. Ten Frue concentrators are employed.

UTICA.—A twenty-stamp mill is working night and day, and the latest improvements in crushing and reduction have been adopted, much to the profit of the company.

INYO COUNTY.

MAXIM.—The Duncan concentrators in this mill, having successfully worked the galena ores for which they were purchased, have lately worked about 100 tons of gold-bearing sulphuret ore, to test their value on that kind of ore. The success was greater than with the galena ore. The working of the sulphurets is so complete that the yield of gold is very nearly equal to the assay value of the ore. Mr. Stansfield, the superintendent, is fully satisfied with the Duncan concentrator. All varieties of gold and silver ores found in Inyo County can be successfully worked.

MONO COUNTY.

MAMMOTH.—It is reported that this mine, which is about sixty miles south of Bodie, has been started up again after a shut-down of over six years. The mine, it is said, has a large vein of ore. A 40-stamp mill was built on the ground, but for some reason the ore taken from the mine would not pay to mill. The stock of the company sold as high as \$25 a share in the summer of 1879. A flume three miles long was built from one of the mountain lakes to convey water for motive power to drive the mill. Until recently, the camp has been entirely deserted.

BODIE DISTRICT.

BULWER.—The vein in No. 1 uprise, 200-foot level, varies from 10 to 16 inches in width of good milling ore. It is intended to push this rise as fast as possible and cross-cut back from the face. The vein in the east cross-cut was cut on the 23d ult. It is a clean and well-defined ledge. Work has been resumed on the main north drift. The ore in this drift shows much improvement in quantity and quality. The face, on the 27th ult., showed 2½ feet of clean ore that gives better assays than at any other point in the drift.

NEVADA COUNTY.

SOUTH YUBA.—The ten-stamp cement mill on the drift gravel claim of this company at Chalk Bluff is reported to have been totally destroyed by fire. The mill has been idle for several months. It is not known how the fire started. The loss approximates \$5000.

PLACER COUNTY.

MINES DE GOLDEN RIVER.—Development is pushed vigorously. M. de la Boulglise is on his way to the mines, and will arrange their further working.

SAN BERNARDINO COUNTY.

CALICO MINING AND REDUCTION COMPANY.—The mill is said to be a success. Since starting on the 4th ult., \$10,000 of bullion have been shipped.

SIERRA COUNTY.

YOUNG AMERICA.—The 100,000 shares of stock, reserved as a working capital by this company, have been sold to the last share. The principal portion of it was disposed of in San Francisco at 40 and 50 cents a share, the latter price having been obtained for most of it. The suit in equity, brought to dissolve the injunction restraining the sale of a certain lot of this stock, has been argued, and the court has decided to continue the injunction. The trial of the main issue is set down for August 25th.

COLORADO.

The Leadville Herald reports the following:
The results of a number of tests made by Mr. Haw-

ley at leaching Leadville ores by the Russell improved process recently published by the Herald, and republished in the JOURNAL of July 25th, showed that the dry ores, such as are produced by the Lee, Matchless, and neighboring mines, can be leached to within 94 per cent of their silver contents. Since then, the Herald has learned of other parties who have experimented with leaching, that they obtained similar results, and that the Leadville chloride-bearing ores could be economically treated by leaching.

The most interesting feature developed during the tests was, that raw ore would give as good and sometimes better results than when the material was first roasted and an effort made at chlorination. These facts show that the natural chloride of silver in the Leadville ores is as susceptible to the action of the hyposulphite solution as the chlorides produced artificially by the heating of the mineral and the addition of salt.

Several tests made some time ago gave but indifferent results, and it was then generally thought that the fixed chlorides in these ores could not be digested by economic solutions, and consequently could never be treated by any known leaching process. To prove this opinion erroneous is worth considerable to this district. As an explanation of the conduct of the ore that withstood attempts to leach them, it may be stated that much of the ore found in this district, and especially the bromo-chloride of silver bearing ores, show coatings of silica and lime in vugs, cleavages, and other interstices. It is barely possible that such coatings cover the small crystals and flakes of chloride of silver and prevent their ready digestion.

CLEAR CREEK COUNTY.

GARFIELD.—The officers of this company have recently examined their properties with the view of further developing and pushing work on all their claims. The property is in Daily District and on Williams's Forks. The Monarch lode has a tunnel 250 feet in length, equipped with cars, track, etc. The ores show decided improvement. The Garfield and Hancock lodes are worked by a cross-cut tunnel that is in 110 feet. The Living Wonder and J. H. Becker lodes will be worked by cross-cut tunnel. The tunnel is in sixty-five feet. All the above property will be patented this season.

KOHINOOR & DONALDSON.—London advices state that it is estimated that £5000 will be required to carry on operations, and free the company from indebtedness.

MONTEZUMA.—The mining company owners of the Chautauqua group of lodes at Montezuma contemplates resuming work on its property in a short time. It has let a contract to run a cross-cut tunnel 300 feet in length.

UNION SMELTING AND REFINING COMPANY.—The works are running day and night.

CUSTER COUNTY.

BASSICK.—Advices from Rosita state that on the 30th ult. an order appears on the records in the office of the Clerk of the District Court, as made by Judge Yeaman in Chambers July 29th, relieving James W. Kurtz from the receivership of the Bassick mine, to which Mr. Kurtz was appointed at the last term of the District Court that was held in this county. It is believed here that the warring factions in the Bassick Mining Company have agreed upon a person to take charge of the property until their differences are settled, and they are ready to put a force of men at work.

BULL-DOMINGO.—Parties who have recently examined this mine state that the present developments show about \$85,000 worth of ore, which should be mined and milled at an expense of less than fifty per cent.

DOLORES COUNTY.

GRAND VIEW.—The smelter is receiving ore from the Mendota and Sheridan mines of Marshall Basin and other mines in the San Miguel section. A new water-jacket, cupelling-furnace, and other machinery ordered some time since is on the road. It is altogether probable that the lower grade ores of the Grand View will be concentrated by Frue vanners.

GILPIN COUNTY.

CALIFORNIA GOLD MINING COMPANY.—An extraordinary general meeting was to be held at London on August 4th, to consider the present position of the company, and to pass such special or other resolutions as to raising further capital, or the exercise of borrowing powers by the directors, or as to any other steps to be taken for the future working or otherwise

of the company's business, as to the meeting shall seem fit.

DENVER GOLD COMPANY, LIMITED.—An extraordinary general meeting was held at London on the 24th ult., for the purpose of considering and, if deemed advisable, confirming the following subjoined resolutions, which were passed at an extraordinary general meeting of the company held on the 6th ult. and to which reference was made in the *ENGINEERING AND MINING JOURNAL* of the 25th ult.: 1. That the capital of the company be increased by the issue of 80,000 preference shares of 5s. each, to be credited in the capital and books of the company as having the sum of 2s. 6d. a share paid thereon, such preference shares carrying rights as follows: (a) To a non-cumulative preferential dividend of 10 per cent on the nominal amount of such preference capital out of the profits of the undertaking in each year. (b) To equal participation, share per share, with the ordinary shares in such further profits as shall remain for distribution each year after payment of the above 10 per cent preference shares. (c) To a preference in respect of capital in the event of the liquidation of the company. 2. That the directors be and they are hereby authorized—(1.) To offer the said preference shares in the first instance and subject to acceptance within a time to be fixed by the directors, to the existing members of the company who have registered addresses in the United Kingdom and whose shares are fully paid, and (in the event of over-subscription) to allot the said preference shares ratably, or as near thereto as circumstances in the opinion of the directors will admit, among such of the existing members of the company being applicants, in proportion to the amounts of their existing holdings. (2.) To dispose of any of such preference shares as may remain unapplied for by existing members of the company as above, in such manner, on such terms, and to such persons as shall to the directors seem fit in the interests of the company.

LAKE COUNTY.

The *Leadville Herald* reports the following:

Several of the Leadville smelters are now quite well supplied with lead ores, and will be enabled to run at full capacity hereafter.

DUNKIN.—The product for July was about 300 tons of smelting ore.

FARWELL CONSOLIDATED.—These gold mines at Independence promise to yield quite largely during the present season. The lessee has been working for about two months opening up the vein and getting the tunnels and other openings in working shape. In doing this work, about 100 tons of fine milling ore were extracted, and four good ore-faces opened up. The mineral saved for milling runs from \$20 to \$60 a ton. The property is well supplied with milling facilities, but neither of the mills will be started up until at least one thousand tons of ore have been accumulated. The tailings from the mill are passed over blankets and subsequently sent to buddles, in which process all the base metals, containing considerable silver and some gold, are saved.

FOREBAUGH.—It has been found impossible to drain the mine of water, and operations have been suspended, and will not be resumed until the large new pump arrives, which will be early in September.

HEBBIETT.—As soon as the water can be conquered and the resources now exposed in the lower levels extracted, the mine will probably be one of the largest producing mines in the district.

IRON SILVER.—The suit of the government against the Iron Silver Mining Company, which has been on the United States Court dockets off and on since 1883, received its quietus on the 27th ult. at Denver, from the hands of Judge Brewer, who dismissed the case on the ground that the evidence failed to show that the patent entries for the 350 acres of land near Leadville, in question, gave evidence of any fraud or fraudulent intent.

LA PLATA.—The furnaces of the La Plata smelter were running with dampers open last week, and the fumes were sent up the shaft. Inquiry brought the information that the large dust-chambers connecting the furnaces with the stack on the hill-side above the works were cleaning out. The operation will take several days, and will yield a hundred or more tons of valuable flue-dust. The product of the dust and fume condensing-chambers will be mixed with lime and clay, molded into bricks, and, after being dried in the sun, it will be thrown back into the furnaces and smelted.

ROBERT E. LEE.—The output for July was about 900 tons of iron ore and 400 tons of silver ore.

LARIMER COUNTY.

The mines in the vicinity of Loveland are yielding about 100 pounds of ore a day to the man. The quality of ore is beyond all question exceedingly fine, being about 75 per cent bismuth, which, when pure, is worth \$2.50 a pound.

PARK COUNTY.

SOVEREIGN.—This company recently sent a lot of ore to Denver to be tested on the Matchless concentrating machine now on exhibition in that city. The results, it is stated, proved very satisfactory, and the new mill of the company is to be provided with a number of the Matchless machines.

PITKIN COUNTY.

The new copper furnace at the smelter at Aspen has been blown in. It will treat the copper matte from the other two furnaces.

There is a movement on foot to erect a large concentrator in Aspen. The scheme is nearly perfected.

The jury in the Webber-Nevitt case, at Aspen, brought in a verdict, on the 30th ult., for the plaintiff for \$16,000. A motion for a new trial was refused. A motion of appeal was given and the bond was fixed at \$18,000. Webber had a lease on the Emma mine in his brother-in-law, Nevitt's, name, giving him one third for its use. The suit was brought to recover the other two thirds.

The Federal Court at Denver has removed the receiver of the Aspen mine, who was appointed by the District Court.

FULTON.—The company has concluded to start up work in the J. C. Johnson mine.

SUMMIT COUNTY.

ROBINSON CONSOLIDATED.—During July, there were shipped about 500 tons of from 50 to 75-ounce ore. The entire mine is worked under the tribute system. The tribute workers pay a royalty of from 45 to 50 per cent, according to the ground they are working in, and the grade and quantity of the mineral secured. For some time past, the larger portion of the mine's product was obtained from the newly discovered south ore-chute, but this supply has now been shut off by water, and renewed energy is displayed in working along the course of the main ore-chute; the lower workings in this portion of the mine are also flooded, but pumping machinery is erecting, and it is thought that the mine will soon be drained. The indebtedness of the company, it is stated, has all been discharged and a surplus fund of about \$40,000 accumulated in the hands of the treasurer.

IDAHO.

CLIFF.—The furnace has been blown in, with good prospects for a summer and fall campaign, and the managers intend, if the outlook continues as favorable as at present, to double the smelting capacity this fall.

MARYLAND.

MARYLAND COPPER MINING COMPANY.—This company has been organized, with a capital stock of \$50,000, to carry on a general mining business in Washington County and elsewhere in Maryland. The existence of the company is fixed at forty years. The incorporators are Samuel Fockler, of Cavetown; J. A. Wishard and H. W. Lyday, of Smithsburg; H. C. Demming and D. C. Burnite, of Harrisburg.

MICHIGAN.

IRON MINES.

The following statement, published by the *Marquette Mining Journal*, shows the amount of iron ore and pig-iron shipped from the lake ports of that district for the season, up to and including Wednesday, July 29th:

	Gross tons.
Marquette	300,327
Pig-iron	1,430
L'Anse	19,136
St. Ignace	38,117
Pig-iron	2,149
Escanaba, Marquette District	264,373
Menominee District	356,247

The shipments by lake from all ports of the district up to date amount to 978,200 gross tons, the falling off, compared with last season, being 378,750 tons.

ELLSWORTH.—This property is to be started up again. It is about two miles distant from the old Magnetic mine. Some work has already been done, a shaft started, and a vein of good ore exposed. It has a width of 14 feet, and runs 65 per cent in metallic iron, and is within the limit on phosphorus. The trouble thus far with this property has been that it

had no outlet for its ore, but with the road now to the Erie, two miles distant, this difficulty can be overcome.

NORTHWEST REPUBLIC.—A small force is employed in sinking a shaft, and it is stated that the ore is improving in quality with depth. The vein of ore has a width of sixteen feet.

MINNESOTA.

The shipments of iron ore from the port of Two Harbors were as follows for the week ended July 29th:

	Gross tons.
Minnesota Iron Company	8,389
Previously reported	92,524
Total	100,913

MONTANA.

DEER LODGE COUNTY.

Private advices from Phillipsburg state that the prospects of mining in that neighborhood are bright. A syndicate has bonded a parallel lode with the Granite Mountain. It has begun to sink, and the vein looks very encouraging. The ore resembles the Granite Mountain ore, and is quite rich in silver.

GRANITE MOUNTAIN.—The mine is looking well, and turning out its regular quota of ore and bullion. The developments toward the deep are of the most encouraging character. The shipments during the past three months have averaged 80,000 ounces of silver a month. The expenditures are comparatively light, owing to the fact that all the mining operations are performed through tunnels.

HOPE.—The mine pounds out with its little ten-stamp mill quite a respectable showing of bullion.

LEWIS & CLARKE COUNTY.

R. B. Harrison, United States Assayer at Helena, in his annual statement, shows that the receipts of the precious metals for the fiscal year ended July 1st, 1885, at the Helena Assay-Office were \$1,031,159.87 in gold and \$65,291.95 in silver; grand total, \$1,096,451.82.

NEVADA.

ESMERALDA COUNTY.

It is reported that the closing down of the Mount Diablo, Holmes, and other leading mines at Candelaria is entirely due to a dispute between the managers and the miners over the wages question, the miners having refused to work for \$3 a day instead of \$4, the amount paid heretofore. Later advices state that some of the men agreed to work for \$3 a day, but were prevented from going into the mine by the men who had worked there before. There is no miners' union in Candelaria, but there is said to be a movement on foot to organize one immediately.

EUREKA COUNTY.

RUBY HILL.—Work continues to be prosecuted in this tunnel that penetrates a group of mines on the west side of Prospect Mountain. The header has been advanced a distance of 1000 feet, and a new contract will be let to extend it another hundred feet. While the formation passed through recently is decidedly favorable, yet no ore that would pay to mill has been encountered. The work thus far has cost, including labor, salaries, supplies, advertising, etc., \$11,000, or \$11 a foot.

LINCOLN COUNTY.

MEADOW VALLEY.—Through a deferred and unsettled business transaction, this entire property fell into the possession of Messrs Griffin and Eiseman, who are willing to make a most favorable proposition to any men of means, or any syndicate, who will prosecute work on the property. The mine, it is said, is equipped with machinery that must have cost originally \$300,000. Up until the fall of 1877, when the company suspended active operations, the mine produced some \$6,700,000, and since that time tributaries and chloriders have extracted many thousands more from the upper levels. Work has been prosecuted in the property to a depth of 1240 feet, and below the 1200-foot level three winzes are sunk, all in ore assaying from \$25 to \$180 a ton. There are 13 levels in the mine. A true fissure-vein, 1800 feet in length, extends through the property. It is from six to eight feet wide, and its formation, being quartz and porphyry, is free milling.

STOREY COUNTY—COMSTOCK LODGE.

CHOLLAR.—As there are no available water-power mills, and as the bins at the dump are all filled with ore, the Chollar croppings have been temporarily shut down. A large amount of dead-work has been done on the upper levels in opening out the ore-body, and if

mills could be got, these croppings would now be producing about 100 tons of ore per day.

CONSOLIDATED CALIFORNIA & VIRGINIA.—During the week ended the 25th ult., there were extracted 773 tons of ore, and shipped to the Morgan mill 815 tons. The average assay value of the ore milled during the week, as by battery samples, was \$20.67 a ton. Ore extracted under the Jones contract, 380 tons, and shipped to Eureka mill under that contract 351 tons. The average assay value of the ore milled during the week, as by battery samples, was \$17.70 a ton.

CROWN POINT AND BEST & BELCHER.—The mines have been closed down, only a few men being retained for making repairs and prospecting on the levels below the 1400. Negotiations are pending with ranch owners on the river to allow the water to take its natural course instead of allowing it to run to waste and evaporate by being distributed over hundreds of acres of ground from which the crops have been gathered. Should these negotiations result successfully, the Crown Point and Belcher will be started up again. The Santiago and Vivian mills on the Carson River (which have a combined crushing capacity of about 150 tons daily) have shut down. They were running at their full capacity on ore from the above mines.

HALE & NORCROSS.—The machinery for the new hydraulic pump has been tested at the Union Iron Works in San Francisco and worked satisfactorily, and will be lowered and placed in position on the 3000 level as fast as the sections arrive. It is expected to be in running order by the 15th.

THOMPSON.—A. J. McCone has recently purchased this mill in Lower Gold Hill, and is putting it in complete repair for the purpose of crushing ore from the Woodville and Justice mines.

YELLOW JACKET.—The Brunswick mill will start up with steam, and if the ore will stand the additional cost for fuel, the mill will be kept running steadily at its full capacity.

NEW MEXICO.

GRANT COUNTY.

CARLISLE.—The new machinery on this mine was started up again about the 1st of August. The additional parts were shipped from San Francisco, and were expected to be on the ground and working by that time. If this new mill should prove a success, two more will at once be ordered, erected, and started to work in the camp.

UTAH.

SALT LAKE COUNTY.

EMMA.—The shareholders have acceded to the proposals of the board to raise more capital. Comparatively little damage has been done by the snow-slides.

SUMMIT COUNTY—UINTAH MINING DISTRICT.

PARK MINING AND MILLING COMPANY.—The capital stock of this company is \$2,000,000 in 200,000 shares of the par value of \$10 each. The principal place of business is at Council Bluffs, Iowa, with branch offices at Salt Lake City, Park City, and New York City. The mining properties owned and to be operated by this company are the Council Bluffs, Omaha, Chicago, Detroit, Tahoe, Rose Camp, R. K. D., Malachite, Montana, Belmont, Queen of the Hills, King William, Keokuk, Ottumwa, Broadway, Lone Tree, Jupiter, Liberty, General Dodge, and Chapman. One hundred thousand shares have been placed on the market as a working capital. The incorporation is organized under the laws of Iowa, and is to last twenty years from July 17th, 1883.

VERMONT.

ORANGE COUNTY.

ELIZABETH.—An occasional correspondent has sent us the following information: This would seem a bad time to say much about copper mines; but these "bad times" will not last always. Good copper mines will again be sought after, and while it is no doubt true that the greatest deposits of that metal probably in the world are to be found on Lake Superior and in the far West, it is none the less true that it is not necessary to go so far to find a most remarkable one, of which little has been heard, and one that, with a small portion of the capital so freely bestowed farther from home, will not fail to prove of great value. This mine is in the town of Strafford. The outcropping of the vein has been used in the manufacture of coppers for many years, and the surface ores melted for copper on a small scale, at different times, with more or less success; but the real nature of the vein and its value as a copper mine have only recently begun to be developed. A shaft has been sunk and ore stoped as deep as 180 feet, where the vein is about 20 feet wide, and a decided improve-

ment in the quality of the ore. Copper is displacing the iron or "mundic" that predominates at the surface, verifying the truth of the well-known old Cornish saying, "Mundic rides a good horse." Several thousand tons have been taken out at this point in a quiet way and melted on the spot; but the demoralized condition of the copper market has deferred larger operations. The pig-copper tests 98½ per cent, and contains no injurious substance. The work done has been principally for development, and the mine is ready for stopping. The ores melted from at and near the surface averaged about 4 per cent; those taken from 100 to 160 feet deep run from 6 to 7 per cent. Strafford is about seven miles from Sharon on the Central Vermont railroad, and ten from Pompanoosic on the Passumpsic road, connected by daily stage from both stations. The mine is open to any one taking sufficient interest to pay it a visit.

BULLION PRODUCTION FOR 1885—SPECIAL OFFICIAL REPORTS.

MINES.	States.	Month of June.	Year from Jan. 1st, 1885.
Adams, s. l.	Colo.	30,000	206,103
Alice, g. s.	Mont.	96,352	549,286
Belmont	Nev.		10,003
Bodie, g.	Cal.		**17,907
Boston & Montana, g.	Mont.	44,044	226,840
Christy, s.	Utah	21,795	130,229
Chrysolite, s.	Colo.	6,722	31,428
Colorado Central, s.	Colo.	19,682	111,072
Consolidated Bobtail, g.	Colo.	7,831	41,228
Deadwood-Terra, g.	Dak.		177,291
Derbec Blue Gravel, g. s.	Cal.	12,546	79,789
Essex, g. s.	N. S.		6,474
Eureka Consolidated, s. l.	Nev.		10,266
Father de Smet, g.	Colo.	31,373	186,588
Freeland, g. s. c.	Colo.		182,218
Grand Prize, s.	Nev.	15,576	153,643
Granite Mountain, s.	Mont.	111,489	508,543
Hall-Anderson, g.	N. S.		3,605
Head Center & Tranquillity	Ariz.		85,396
Hecla Consolidated, g. s. l. c.	Mont.		*339,640
Helena, g. s. l. c.	Mont.	63,838	473,594
Homestake, g.	Dak.		489,976
Hope, s.	Mont.	13,818	80,446
Iron Silver, s. l.	Colo.		251,167
Kentuck, s.	Nev.	490	2,328
Lexington, g. s.	Mont.	70,615	430,827
Montana, Limited, s.	Mont.	66,202	341,175
Moulton, s. g.	Mont.		310,792
Mount Diablo, s.	Nev.		146,312
Navajo, s.	Nev.		22,894
New Hoover Hill, g. s.	N. C.	8,600	37,209
New Pittsburg, s.	Colo.		9,594
North Belle Isle, s.	Nev.		2,118
Ontario, s.	Utah		901,259
Oxford, g.	N. S.		1,965
Plymouth Consolidated, g.	Cal.	82,657	483,608
Rooks, g.	Vt.		28,383
South Yuba, g.	Cal.		1,168
Standard Consolidated, g.	Cal.	16,362	78,478
Stormont, s.	Utah		53,379
Syndicate, g.	Cal.		**62,327
Tombstone, g. s. l.	Ariz.		290,804
Total			7,604,266

G., gold; S., silver; L., lead; C., copper. Silver valued by the different companies from \$1@1.29 per ounce; gold, \$20.67. * Not including value of lead and copper. † Royalty. ‡ Net. No shipments during month mentioned. ** Not official.

MARKETS.

Silver.

NEW YORK, Thursday Evening, August 6.

DATE.	London.	N. Y.	DATE.	London.	N. Y.
	Pence.	Cents.		Pence.	Cts.
Aug. 1	49½	106½	Aug. 5	49½	107
3	49½	106½	6	49 3-16	*
4	49½	107			

* 107½@107.

The fractional advance that has taken place in sterling and in Indian exchange has had a favorable effect on silver here.

There has been an increasing demand for silver dollars at the Sub-Treasury in this city since the government has stopped printing \$1 and \$2 bills, and since it redeems mutilated currency in silver. Withdrawing all the small bills is the only way in which any large amount of silver can be kept in use, and the government has made a good beginning in doing this; \$110,000 in silver dollars was paid out by the Sub-Treasury yesterday.

Purchase of Silver Bullion.—The Treasury Department, on the 4th inst., purchased 170,000 ounces of silver for coinage into standard dollars at the Philadelphia Mint.

United States Mints.—The statement for July

shows that the total coinage executed at the United States Mints consisted of 1,900,000 standard silver dollars.

United States Assay-Office at New York.—Statement of business for the month ended July 31st:

Deposits of Gold.	
Foreign coin	\$146,000
Foreign bullion	87,000
United States bullion	535,000
United States bullion (re-deposits)	172,000
Jewelers' bars	98,000
Refined gold	147,000—\$1,185,000
Deposits of Silver.	
Jewelers' bars	\$22,200
United States coin	200
Foreign coin	33,600
Foreign bullion	147,000
United States bullion (contained in gold)	8,100
United States bullion, re-deposits	6,206
Arizona	3,600
California	900
Colorado	4,400
Dakota	3,000
Idaho	2,000
Lake Superior	1,000
Montana	206,000
New Mexico	7,000
Utah	7,000
Refined silver	400—452,000
Total deposits	\$1,637,000
Gold bars stamped	\$113,950
Silver bars stamped	100,172—214,123

Copper.—Though there is no activity in the market because sales are so largely made directly from the producer to the consumer, and do not pass through the dealers' or brokers' hands, yet the price is firm and advancing. We quote: Lake 11½@11½c.; Electrolytic, 11c. nominal; Orford, 10 35@10 45c.; Arizona brands, 10½@10½c.; Baltimore B. C. W., which is still scarce, 10 35c.

There is no noticeable change in the market beyond its increasing firmness, but there is an almost universal expectation of higher prices later in the season. The Calumet and Hecla Sphinx gives no sign as to the course it intends pursuing, but it is unquestionably within the power of that company to advance copper, and there are signs that seem to indicate this to be its intention.

Chili Bars have been very steady; they stand at £43 10s., and have fluctuated only from that figure to £43 15s. during the week. Best Selected, £43 10s.

The Anaconda, from recent Butte advices, is running from 14 to 16 furnaces, though roasting as many tons as heretofore, and is said to be working on the 1000-foot level. It would be natural to expect a lower grade ore in depth.

The Parrot Company is showing full blast, and is sinking to the 430-foot level. The ore above the 390-foot level is mostly extracted. No ore is hoisted from the Liquidator at present.

The Bell is stopped, as announced, in our last. Clark's Colusa has ore yet for a few months, and must then explore. In a word, there will be no increase from this district, and all the Butte mines have a hard struggle to produce copper without loss when the price for fine copper is 10½c. in New York. From the report of the Bureau of Statistics, the exports of domestic copper during the fiscal year were:

	1885.	1884.
	Pounds.	Pounds.
Ingot	44,672,493	169,39,880
Sheets	59,365	105,680
Total	44,731,858	17,044,760
Less imports	4,060,342	2,621,439
Total	40,671,516	14,423,321
Ore, tons	41,615	19,307

Tin.—The tin market is still under the spell of the manipulators, and in such a condition no one will buy beyond immediate necessity.

In London, the decline noticed in our last issue stopped at £93 15s. until yesterday, when the price receded to £93 10s., and to-day at the close of business it stands £93 12s. 6d., and for three months £92 5s.

Here spot is nominally \$22, though there are no buyers. On the Metal Exchange, August is quoted 21c.; September, 20 75c.; and October, 20 65c.; but next week may change these.

Mr. Charles Nordhaus, No. 13 Cedar street, New York, gives his monthly statistics as follows:

	Tons.
July 1st, stock in the United States, estimated	1,460
July 1st to 31st, arrivals, estimated	700
Total	2,160
July 1st to 31st, less consumption, estimated	900
August 1st, stock, estimated	1,260
Afloat:	Tons.
From Straits	200
From Australia	100
From Europe	800 1,100
August 1st, visible supply	2,300

Imports during the Fiscal Year.

	1885. Pounds.	1884. Pounds.
Imports	23,960,653	26,013,972
Less re-export	66,516	68,205
Net import	23,894,037	25,945,767
Or tons	10,667	11,583

Shipments from the Straits Settlements to the United States during the first Five Months.

	Piculs.	Equal to tons.
1885	16,051	980
1884	24,969	1,470
1883	38,210	2,248
1882	44,261	2,600
1881	20,885	1,228
1880	66,702	3,924

Lead.—The lead market is steady, though sales have been only 300 or 400 tons. Sales are rather heavy at 4 25c., and some lead can be had at that figure, though none can be purchased for less, nor is more asked.

The "C. C." (Corwith Combination) still holds the fort stoutly, and as the production is probably even below the consumption, consumers may have to concede the C. C. terms. As we have already stated, the statistical position favors the producer, and the price will probably advance beyond the present figures. Our St. Louis and Chicago telegrams note an active and advancing market—even more active than here.

Cable advices to the Metal Exchange quote soft Spanish at £12 5s., as a week ago. The cholera has had but a temporary effect on that market, and since the Spanish lead can not come in here below 4 3/4c., it has no effect on our market.

Messrs. John Wahl & Co., of St. Louis, telegraph to us as follows to-day:

Market is advancing on account of large purchases by speculators in the East, and to-day market very firm; both Desilverized and Chemical generally held at 4 1/2@4 15c. Large holders have generally withdrawn from market, so that offerings are very light for spot or near future delivery. We look for higher prices.

Spelter is still dull and neglected beyond its merits, though it has advanced a little. We quote 4 40@4 50c. for Domestic, with the market firm but dull. Foreign, 4 70c.

Silesian Spelter in London stands at £13 15s. Our imports during the fiscal year are given by the Bureau of Statistics as follows:

	1885. Pounds.	1884. Pounds.
Imports	3,598,083	5,363,062
Less re-export	3,610	3,003
Net import	3,594,473	5,360,059
Or tons	1,605	2,394

Sheet-Zinc is worth 5@5 1/2c. for Domestic. **Antimony** remains steady. Cookson's is quoted at 9 1/2@10c. and Hallett's 9@9 1/2c., with a moderate business.

Bismuth—Worth from \$2@2.25 a pound. **Aluminium**—\$8@9 a pound; 10 per cent Cowles Aluminium Bronze Ingots, \$1 a pound; 7 per cent Aluminium Bronze, 78c. a pound; 5 per cent Aluminium Bronze, 56c. a pound; 2 1/2 per cent Aluminium Bronze, 34c. a pound; Aluminium Silver, 75c. an ounce.

IRON MARKET REVIEW.

NEW YORK, Thursday Evening, August 6.

Anthracite Pig.—The pig-iron market shows no improvement, and while prices are nominally unchanged at this point, the market is dull and weak, and standard brands of Lehigh may be quoted as follows: No. 1 X, \$17.50@18; No. 2, \$15.50@16; Gray Forge, \$15@15.50, and outside brands sell down to 50 cents less than these figures. We hear of Southern iron offering here and in Philadelphia at very low prices.

Scotch Pig.—Only 200 tons of Scotch Pig came in last week and 500 tons this week, so that there is nothing doing. Prices are nominal, and are frequently shaded. We quote: Coltness, \$19.50@20; Summerlee, \$18.50@19; Eglinton, \$17.50, to arrive. These prices are shaded for large lots, or according to the necessities of the occasion.

Bessemer Pig and Spiegel.—There is very little doing in these articles here, though we hear of sales in Philadelphia. We quote nominally: Foreign Bessemer Pig, \$18; Domestic, \$16; 20 per cent Spiegel is worth \$25, though some has been sold below this figure.

Steel Rails.—The mills are for the most part

fairly well supplied with orders, and there are no stocks. The price, \$27 at the Eastern mills, is still maintained nominally, and the very low cash figures that were named some time ago are not now heard of. Next week, the manufacturers of steel rails and other steel products are to meet at Long Branch. As the meeting is called by the two representatives who at the last meeting opposed the combination, it is assumed that some arrangement will be arrived at by which the price will be advanced. There are inquiries for large lots in the market. A single inquiry is for 30,000 tons, and from Philadelphia we hear of still larger orders. This may be in anticipation of an advance in prices, or it may be, as we hope, from an improving business on the railroads, which consequently feel encouraged to make much needed repairs. We hear of sales for several thousand tons, among other lots, 3000 tons for the Union Pacific Railroad goes to the Edgar Thomson.

Structural Iron.—The bridge-builders are busy, and a good deal of bridge iron has been sold; the prices remain unchanged. We quote Plate at 1 90@2c.; Shell, 2 1/4@2 1/2c.; Flange, 3 1/2c.; Beams, 3c.

Philadelphia. Aug. 6.

[From our Special Correspondent.]

The only item of interest in the crude iron industry is the effort by the makers of certain standard brands of iron to unload some accumulated stock. Forge irons have been offered as low as \$15 for a very desirable make. None of the special brands have been dropped as yet, and so far as can be ascertained, there is no disposition or necessity to lower prices, which all makers of special trade say are low enough already. The outlook has not improved, although during the week more iron has been sold than usual. Mill owners have been urged to cover fall and winter requirements by contracts. Alabama iron has been offered at \$13.75. Virginia irons, at \$14.50. No. 1 Foundry has been going at \$17@17.75.

Muck-Bars.—Quotations are given at \$27. Small lots have been sold at \$26@26.50. There is more muck-bar made than usual. The nail-makers have good orders in.

Foreign Iron.—In the absence of transactions, quotations are \$19 for Bessemer; \$24@25 for 20 per cent Spiegel; \$31 for 30 per cent. There is one inquiry for a 1000-ton lot of Spiegel.

Manufactured Iron.—More iron is selling from day to day for immediate requirements. Consumers have nothing. Mill-owners have a few orders for September, but taking bar iron as a whole, it is weak and dull. Some interior mills are better off. Manufacturers are too anxious to sell to allow of any improvement in prices. Orders at mills run from ten to thirty tons.

Plate and Tank Iron.—A half dozen orders ranging from ten to seventy tons have encouraged two or three manufacturers who were about out. The inquiries are better. Plate is 1 90c. Shell and flange iron are dull. The locomotive-works are not doing much, and the car-works are short of orders.

Structural Iron.—Parties negotiating for structural iron have business in hand for some eight hundred tons of bridge iron. Angles are 1 75@1 80c.; and the combination prices still hold. A great deal of bridge work is pushed through. Trenton, Pencoyd, and Pottstown are crowded. Western inquiries are in hand for some 400 tons. The structural iron-makers all feel good.

Nails.—The Eastern nail-makers will within eighteen months have their own plant to supply nail plate. They admit it is only a question of time for the right sort of steel nail to take the place of the iron nail. The Belfont experiments failed, but others are to be made at Harrisburg, and eventually the best steel-making process will be accepted. Retail lots of nails are \$2.10, car-load lots \$2. The factories are still able to fill orders promptly.

Wrought Pipe.—Orders are arriving faster than work is done, and a good feeling exists among manufacturers East and West over the acceptance of lower discounts.

Steel Rails.—Orders for the week in Pennsylvania mills foot up 17,000 tons, large and small. No case of rails under \$27 is known of, but there is still an active competition. Small lots have been taken at \$27, and large blocks can be had, no doubt, 50 cents less. It was given out this week on apparently good authority, that orders amounting to fifty or sixty thousand tons would be placed this month. The chances

are, these figures will be exceeded, as there are several important undertakings to be taken care of.

Old Rails.—Spot lots are held firmly at \$17.50, but few sell. The best offers this week were \$17.25. Sales will amount to one thousand tons or over.

Scrap.—Scrap has declined a little. Over two hundred tons were sold this week from the various yards at \$17@18, but the tendency is decidedly downward. Car-wheels sold at \$13.50, machinery scrap in small lots at \$12.50, steel scrap at a half cent a pound.

COAL TRADE REVIEW.

NEW YORK, Thursday Evening, August 6.

Statistics.

Production Anthracite Coal for week ended August 1st, and year from January 1st:

Tons of 2240 lbs.	1885.		1884.	
	Week.	Year.	Week.	Year.
P. & Read. RR. Co.	96,736	5,805,789	318,753	5,898,715
L. V. RR. Co.	114,307	2,994,365	163,406	3,210,647
D., L. & W. RR. Co.	85,039	2,377,511	160,402	2,732,135
O. & H. Canal Co.	80,570	1,966,448	117,044	1,966,147
Penna. RR.	**	630,344	**	463,570
N. & West Br. RR.	**	124,498	**	124,815
H. & W. R. RR.	**	124,498	**	124,815
P. & N. Y. RR.	11,943	222,023	15,126	294,015
Penna. Coal Co.	24,643	686,826	42,035	680,168
Penna. Canal Co.	14,715	182,601	10,940	201,966
Shamokin Div., N. C. RR.	15,650	526,595	22,585	572,875
Lykens Valley.	*9,000	285,729	12,369	311,803
N. Y., L. E. & W. RR.	.....	1259,802	.....	1164,871
Total	452,503	16,062,521	892,660	16,060,738
Increase	.....	.....	.....	.....
Decrease	440,157	598,207	.....	.....

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

Production for corresponding period:

1880	12,347,573	1882	15,977,880
1881	15,566,158	1883	16,923,091

* Estimated. † Shipments to June 1st.
** Reports not received.

Chesapeake & Ohio Railroad Company's report of total output and distribution of coal and coke received from mines on line of Chesapeake & Ohio Railroad (including mines on Lexington Division) for the week ended July 21st and year from January 1st. Tons of 2000 pounds:

Kind of coal.	1885.		1884.	
	Week.	Year.	Week.	Year.
Cannel	984	287	11,935	8,359
Gas	2,813	6,002	213,060	173,347
Splint and block	2,295	2,408	84,338	43,855
New River, etc.	10,767	8,645	305,305	241,379
Coke	2,266	1,212	65,571	31,713
Total	19,125	18,544	680,207	498,653

Production Bituminous Coal for week ended July 25th, and year from January 1st: Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1885.		1884.	
	Week.	Year.	Week.	Year.
Philadelphia & Erie RR	.....	18,674	.....	.....
* Cumberland Region, Pa.	60,513	1,490,417	65,836	1,535,528
* Barclay Region, Pa.	3,907	134,468	3,534	178,367
* Broad Top Region, Pa.	.....	.....	.....	.....
Huntington & Broad Top RR.	2,357	91,963	3,124	106,474
East Broad Top RR.	.....	.....	.....	.....
Clearfield Region, Pa.	.....	.....	.....	.....
Snow Shoe	1,857	86,544	3,061	103,773
Karhaus (Keating)	1,725	73,226	1,144	18,688
Tyrone & Clearfield	49,481	1,683,624	57,655	1,737,426
Alleghany Region, Pa.	.....	.....	.....	.....
Gallitzin & Moun-tain	11,354	284,275	7,336	215,713
Total	131,280	3,863,191	141,690	3,895,969

* Tons of 2240 lbs.

WESTERN SHIPMENTS.†

	1885.		1884.	
	Week.	Year.	Week.	Year.
Pittsburg Region, Pa.	.....	.....	.....	.....
West Penn RR.	3,700	138,344	4,148	159,658
Southwest Penn. RR.	1,366	57,904	1,850	81,116
Pennsylvania RR.	5,836	114,521	5,187	159,855
Westmoreland Region, Pa.	.....	.....	.....	.....
Pennsylvania RR.	23,498	623,719	30,857	707,521
Monongahela Region, Pa.	.....	.....	.....	.....
Pennsylvania RR.	8,514	142,547	1,645	86,120
Total	42,914	1,077,035	43,687	1,194,370

Grand total 174,194 4,940,226 185,377 5,090,179
† Considerable gas-coal shipped East, of which no division is made in report.

Production of Coke on line of Pennsylvania RR. for week ended July 25th, and year from January 1st: Tons of 2000 pounds.

	1885.		1884.	
	Week.	Year.	Week.	Year.
Alleghany Region.	3,849	105,593	2,661	75,165
West Penn. RR.	1,541	26,883	.....	24,728
Southwest Penn. RR.	26,140	1,693,699	37,444	1,255,340
Penn. & W. Region	4,910	132,485	3,648	106,482
Monongahela	2,350	57,164	1,423	45,207
Pittsburg Region.	.....	.....	.....	136
Snow Shoe	395	6,732	536	12,975
Total	49,185	1,424,541	45,712	1,520,121
Decrease	.....	95,580	.....	.....

Anthracite.

It is amusing to see the way some of the reports of the coal trade are trying to whistle hot and cold at the same time. After having told their readers, all through the early part of the season when prices were up, that prices were well maintained, and urged them to buy then, as prices would advance, and yet have prices steadily decline and freights go down, must be discouraging. Assuredly, what business men in any industry want is to know the actual condition of the market, whether good or bad, agreeable or disagreeable. They are not pleased, like children, with idle and misleading stories. The market is extremely dull. The failure to lessen the quota of 3,250,000 tons to be mined in August and the growing stocks have added to the feeling of weakness that we have recorded from week to week. Prices are nominally unchanged from last week, but are heavy.

We give the following as fair prices of hard and free-burning coals f. o. b. New York shipping ports:

	Selling prices.	Circular rates.
Broken and Egg	\$3.00@3.25	\$3.40@3.65
Stove	3.60@3.85	4.00@5.00
Chestnut	2.85@3.40	3.65@4.00
Pea	1.80@2.20	2.45@2.65
Buckwheat	1.50@2.00	

Chestnut is still a drug. The Reading Company is asking \$3.10 net alongside, equal to \$2.92 f. o. b. This is just 42 cents a ton for transportation from Schuylkill Haven and loading here, if the company holds to its recent circular, noticed in our last week's issue. Of course, the advance in price announced was on paper only.

The Lackawanna & Western average receipts for July are estimated to have been \$3.22½ per ton f. o. b., which is 1½ cents a ton higher than the average for June and 17 cents less than the average for May.

The Philadelphia Ledger says that last Saturday the Reading Company had in stock 32,000 tons of stove coal, 32,000 tons of chestnut, and 10,000 tons of pea coal. If the stock of chestnut has induced the company to sell as above stated, the general supposition is that stove coal will follow. In fact, the market is weak and lower prices are expected, for stocks are accumulating, and the hand-to-mouth policy of buying by consumers continues.

Bituminous.

The bituminous trade is quiet. The Alexandre line contract, about 25,000 tons, referred to last week, has gone to a Clearfield firm, as has also another contract for 5000 or 7000 tons, and prices remain nominally \$2.75 to \$3 f. o. b.

The transfer of the South Pennsylvania road to the Pennsylvania Railroad will, it is said, certainly take place, and the indications are, that the Pennsylvania Railroad will before very long have much more to say than it now has in the anthracite business also. Unless all its past history is forgotten and a new policy adopted, this would certainly forecast lower tolls and prices for anthracite.

The river shipments from Pittsburg this week have amounted to 5,562,000 bushels.

Philadelphia. Aug. 5.

[From our Special Correspondent]

There is more disposition to buy along the line of the road, but consumers are still very backward, and continue to hold back in the city, expecting lower prices—an expectation encouraged by some newspapers, and the effect of which will be a rush in the fall and probably higher prices. The shipments at tide-water continue fair, and are sufficient to prevent any accumulation except of chestnut and pea, which are very dull. Freights remain low, the same as for six weeks past, with vessels plenty. The quota for August, although nominally larger than for July, is not expected to be practically any greater. Perhaps it would have been better if it had been made less. Fixing the quota in the beginning of the year for the whole season is not the wisest move adopted by the coal magnates. There would be no less mined in the year if it was regulated from month to month, but it would be more judiciously distributed.

Buffalo. Aug. 5.

[From our Special Correspondent.]

There seems to be an agreement existing among our shippers and dealers in coal not to make known the smallest item of interest to the public. Accordingly the report to be made this week of the situation may be summed up in a few words: "Features of the coal trade unchanged."

Under all the smooth appearances of the anthracite

trade, there a rough element somewhere. I was assured by a well-known and reliable man that the price-list for coal was cut on the quiet. The Coal Exchange penalties do not scare some dealers one cent's worth. It is done by way of a secret rebate. My informant described an experience of his own and the result arrived at. He had a contract for a larger quantity than he wanted; a friend asked him to let him have the surplus portion; a price was named; the friend asked for permission and time to see if he could do better, which was granted—result: "Many thanks, do not want your surplus; have bought at bottom prices of the season; hope no ill feeling," etc.

It is reported that the rail rate from Buffalo to St. Louis is now the same as to Chicago, namely, \$1.75 per net ton.

The following communication appeared in one of our city papers on July 29th, and a copy was sent to me:

The impression conveyed in your notice of last evening regarding the dissolution of the soft coal pool does not seem to me to be a correct one. The pool was formed to restrict production and regulate to a certain extent the prices at which coal should be sold in Buffalo and its immediate vicinity. The cause which led to its formation was the excessive overproduction, stimulated by the operations of the late president of the Buffalo, New York & Philadelphia Railroad Company, in building and purchase of new coal roads, development of hitherto unimproved coal properties, also the building of the Rochester & Pittsburg road, and the development by the Rochester & Pittsburg Coal and Mining Company (a corporation controlled by the same persons who built the Rochester & Pittsburg road) of the very large coal enterprise at Du Bois, Punxsutawney, and Beech Tree. It is said that the production of this region alone is more than sufficient to supply the requirements of the Northern market, and the coal from some of the mines is of excellent quality. Under certain traffic arrangements with its Buffalo representatives, the Rochester & Pittsburg road takes a certain percentage of the price (51) at which coal is sold at Buffalo, for cost of transportation. The minimum freight rate is understood to be 81 cents per net ton, or five mills per ton per mile. Thus, if coal is sold at Buffalo at \$2 a ton, the railroad freight rate will be \$1.02 a ton, while coal mined on the line of the low grade road, and the River Division of the Alleghany Valley, is obliged to pay \$1.25 a ton.

In addition to the foregoing: Parties interested in the Rochester & Pittsburg coal production have purchased controlling interests in the coal properties heretofore partly owned by Messrs. Powers, Brown & Co. and the Hamilton Coal Company, and are building a short line of about eight miles of road, with the purpose of transferring this tonnage from the Buffalo, New York & Philadelphia Railroad Company to the Rochester & Pittsburg systems.

In order to sell the enormous quantity of coal mined and transported by the Rochester and Pittsburg Railroad Company, a constant shading of prices by its shippers has been necessary since the formation of the soft coal combination. It is therefore evident that the aggressive policy of the Rochester & Pittsburg management, in its endeavor to control and monopolize, and the operation of the traffic agreement or contract, heretofore mentioned, by which the coal was brought to Buffalo cheaper than by any other competing line, has caused the shutting down of the Claremount mines on the Buffalo, New York & Philadelphia Railroad, and most of those on the River Division of the Alleghany Valley Railroad, the destruction of the soft-coal pool, and the consequent demoralization of prices. The only effect of its existence and operation has been to divert tonnage from the representatives of those mines who lived up to pool rules and prices.

Coal shippers have again adopted the plan of having a special agent to charter vessels instead of relying upon the services of a shipping firm, thereby saving the commission of from \$10 to \$15, and knocking on the head any attempt at combination.

The rates of freight on coal by lake are unchanged. About thirty vessels, mostly of the larger class, are laid up here. Owners were very firm at the close of last week, but shippers met together on Monday, and although stocks had accumulated to a very considerable extent, they determined that no advance should be allowed. Several craft were put in at the old rates on Monday afternoon, as the owners preferred that their vessels should be at the upper end of the lakes than at Buffalo; and afterward, several line boats and

other vessels were chartered. Thus, a complete victory was gained by the coal shippers, and 50 cents is the ruling rate to Chicago and Milwaukee to-day. These vessels will probably be loaded and clear to-morrow.

The shipments of coal by lake from Buffalo from July 30th to August 4th, both days inclusive, were 21,190 tons; namely, 3290 to Chicago, 8240 to Milwaukee, 1800 to Duluth, 1450 to Port Arthur, 1100 to Green Bay, 500 to Manitowoc, 500 to Lake Linden, 800 to Toledo, 400 to Saginaw, 500 to Sandusky, 860 to Winslow, 700 to Sheboygan, 1590 to Detroit. The freight engagements were at the following rates: 50c. to Chicago, Milwaukee, and Port Arthur; 60c. to Manitowoc and Sheboygan; 40c. to Duluth; 20c. to Toledo, Detroit, and Sandusky, and 25c. to East Saginaw. The only canal shipment was one load coal to Albany, at 85c., captain to pay loading and unloading. The nominal rates were: \$1.05 gross to New York, 60c. to Syracuse, and 80c. to Schenectady, captain to pay loading and unloading.

The exports by lake of coal for the month of July were 197,130 tons; for the season to August 1st, 634,610 tons, as compared with 635,380 tons in 1884 and 540,200 tons in 1883; a decrease this year under 1884 of 770 tons. The receipts by canal for the month of July were 28,930 tons; the shipments, 5172 tons; for the season to August 1st, receipts 37,059 tons, and in 1884, 33,816 tons, an increase this year of 3243 tons; the shipments 14,053 tons, as compared with 19,410 tons in 1884, a decrease of 4337 this year. No statistics to hand of railroad movement.

The receipts of coal at Duluth for the week ended August 1st were 28,700 tons.

Buffalo.

My lyre—be careful of that word, Mr. Composer—has been silent for some time, because the condition of the coal trade has not been such as to awake my soul to tuneful lays—far from it. Last week, I attended the meeting of the wise men of the East, and that cheered me up again. When orders are scarce and prices are cut, when funds are low and the bills payable high, there is nothing, at least not much, so refreshing as one of the committee's love-feasts.

Trade is really beginning to "pick up" a little. Although the demoralization is great, there is still an under-current that, if that committee would only adjourn *sine die*, would bring our Western trade into pretty fair shape. So little attention is paid to the rules and regulations, that there is ground for hope that prices may take their natural course, strike bottom, and rebound, and that the legitimate dealer may find his profit in selling coal at a natural advance over cost.

Our local board, emulating the example of the general committee, has caught a few little fellows and taken their little lives for cutting prices. Serves 'em right; they had no business to be little. Last year, they tried it on a little larger chap; but they dropped him soon when they found "how hot his little foot" was, as the Irishman did on examining the bee.

Soft coal men are paying the penalty of their efforts to tie up their affairs beyond the reach of natural laws. I fancy our friends B. L. Y. smile softly to themselves when they see the predicament of most of the other shippers who were so eager to form this year's pool.

OCCASIONAL.

Boston. Aug. 5.

[From our Special Correspondent.]

There has been but little activity among the anthracite agents and jobbers this week. There is no change in the situation. The market is keeping the same unsatisfactory course as for several weeks past. Any change, it is believed, will be of a declining nature, should there be any change in the next month or six weeks; but the market may drag along on its present basis. The trade has no confidence in the situation, as there is evident friction among the companies in the combination.

Thus far, there have been no steps to secure the restriction in August, which all—even the most hopeful advisers of the anthracite trade—believe to be necessary. With one or two companies sold ahead largely, and clamorous to mine all they possibly can, it looks as if restriction would come very hard, if at all, notwithstanding the fact that stocks in the aggregate are too large. Individual operators have been mining a great deal of coal this year, and a large quantity of this outside coal is crowding the market. Such low figures are obtained for this coal that individual operators have recently begun to fail. In some cases,

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES (No., Par value), ASSESSMENTS (Total levied to date, Date amount per share of last), DIVIDENDS (Total paid to date, Date and amount per share of last). Rows include Adams, Alice, Amie, Atlantic, Argenta, Barbee & Walker, Bassick, Belle Isle, Belcher, Big Bend Hydraulic, Black Bear, Bolie, Bonanza Development, Bonanza King, Boston & Mont, Breese, Sulwer, Calumet & Hecla, Carbonate Hill, Caribou, Castle Creek, Catalpa, Central, Christy, Chrysolite, Colorado Central, Con. Ho. tail, Con. Gold Mining, Contention, Copper Queen, Crescent, Crown Point, Deadwood Terra, Derbec B. Grav., Dunkin, Eureka Con., Evening Star, Excelsior, Father of Smet, Franklin, Freeland, Fresno Enterprise, Gem, Glen, Gould & Curry, Grand Central, Grand Prize, Granite, Granite Mountain, Green Mountain, Hale & Norcross, Hall-Anderson, Hecla, Hel's Mt. Red, Henrietta, Holyoke, Homestake, Hope, Iron-Silver, Idaho, Independence, Indian Queen, Inyo, Iron-Silver, Jackson, Kama, Kentuck, La Plata, Leadville, Lexington, Little Chief, Little Pittsburg, Marguerite, Martin White, Minas Nuevas, Morning Star, N. C., Mount Pleasant, Mt. Diablo, Napa, Navajo, New Hope Hill, New York Hill, New York & Colo., Northern Belle, North Bell, Ontario, Ophir, Original, Osceola, Oxford, Paradise Valley, Pleasant Valley, Pymouth, Prussia, Quick Silver, Quincy, Richmond, Riding Sun, Robinson, Robinson Con., Robert E. Lee, Rooks, San Francisco, Savage, Security, Shoshone, Sierra Baites, Sierra Bella, Sierra Grande, Sierra Nevada, Silver Cord, Silver King, Small Hopes, Smuggler, Soeroro, South Yuba, Spring Valley, Standard, Stormont, St. Joseph, Syndicate, Tip Top, Tombstone, True Fissure, United Gregory, United Verde, Valencia, Vindicator, Yellow Jacket.

Table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES (No., Par Value), ASSESSMENTS (Total levied to date, Date and amount per share of last). Rows include Albion, Alhona, Alpha, Alfa, American Flag, Barcelona, Battle Creek, Bear Creek, Beauce, Bechtel Con., Belvidere, Belmont, Best & Belcher, Big Pittsburg, Black Jack, Bonanza Chief, Bondholder, Boston Con., Boulder, Bradshaw, Buckeye, Bull Domingo, Bullion, Byrd & Byrd, Calaveras, Cal. W. & M. Co., Caledonia, Castle Creek, Catskill, Central Arizona, Chapparral, Cherokee, Choliar, Cimarron, Con. Cal & Va., Con. Imperial, Con. Pacific, Crescent, Crocker, Crowell, Coxhead, Darganelles, Decatur, Dunderberg, Durango, Empire, Enterprise, Eureka Tunnel, Exchequer, Globe Copper, Goodshew, Goodshew, Granville, Harlem M. & M. Co., Head Center, Hidalgo, Quartz, Julia Cons., Lacrosse, Leviathan, Lucerne, Mammoth Bar, Mariposa, May Belle, Mayflower, Mexican, Michoacan Synd., Miller Boy, Mono, Moose Silver, Nevada Syndicate, New Pittsburg, North Standard, Noonday, Old Dominion, Oriental & Miller, Overman, Pimeroy, Peer, Peerless, Plutus, Potosi, Hapannock, Retort M. & M. Co., San Pedro, Silver Cliff, Smora, South Bodie, South Bulwer, South Hite, South Pacific, State Line, No. 2, No. 3, No. 4, Nos. 1 and 4, Nos. 2 and 3, Sullivan, Suro Tunnel, Tamarack, Taylor-Plumas, Tioga Cons., Fuscarora, Unadilla, Union Con., Utah, Vandewater, Washington, Wellington, Whalen Copper.

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. + This company, as the Western, up to December 10th, 1881, paid \$1,470,000. † Non-assessable for three years. ‡ The Deadwood has previously paid \$275,000 in eleven dividends, and the Terra \$75,000. § Total number of shares, 591,907; 5,000 shares have never been issued, and are still held by the company.

NEW YORK MINING STOCKS.
DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.	NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.																									
	Aug. 1.		Aug. 3.		Aug. 4.		Aug. 5.		Aug. 6.		Aug. 7.				Aug. 1.		Aug. 3.		Aug. 4.		Aug. 5.		Aug. 6.		Aug. 7.																											
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.			H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.																										
Alice, Mon.																										Albion																										
Annie Con., Co.																											Alta		.35			.40												.45								1,000
Argenta																										American Flag																										
Bassett, Co.																										Barcelona, G.																										
Belle Isle, Ne.																										Bechtel Con., G.																										
Bodie Cons., Ca.	1.70			1.70			1.65					1.65													Belvidere																											
Breece, Co.																									Belcher																											
Bulwer, Ca.	.47			.48			.47					.45												Best & Belcher, G. S.	2.35																											
California, Ne.																								Big Pittsburg, S. L.																												
Cal. & Hecla, Mich.																								Bridshaw, S.																												
Castle Creek																								Bull-Domingo, S. L.																												
Chollar																								Cal. E. H. 9																												
Chrysolite, Co.																								Central Arizona, S.																												
Colorado Central																								Climax, Co.																												
Cons. Cal. & Va., Ne.	1.90	1.80	2.00	1.95								2.00												Cons. Imperial																												
Crown Point																								Con. Pacific																												
Dunkin, Co.																								Dahomega																												
Eureka Cons., Ne.																								Decatur																												
Father de Smet, Dk.																								Durango, G.																												
Findley, Ga.																								Eastern Oregon																												
Gold Stripe, Ca.	.06																							Gardshaw, G.																												
Gould & Curry, Ne.																								Harlem M. & M. Co.																												
Grand Prize, Ne.																								Hortense, S.																												
Green Mountain, Ca.																								Kosuth																												
Hale & Norcross, Ne.	5.75	5.50	6.00				6.25					6.50											Lacrosse, G.	.11																												
Hall-Anderson, N. S.																								Mariposa Pref., G.																												
Homestake, Dk.																								Com., G.	.95																.90											
Horn-Silver, Ut.				2.05								2.00												Mexican, U. S.																												
Independence, Ne.																								Monoc.																												
Iron Silver, Co.																								New Pittsburg																												
Leadville C., Co.	.36																							Noonday																												
Little Chief, Co.	.20																							North Standard, G.																												
Little Pittsburg, Co.																								S. Horn-Silver, S. L.																												
Martin White, Ne.																								DeWitt & Miller, S.																												
Moulton	1.45	1.40																						Potosi																												
Navajo, Ne.				1.00																				Sappanannock, G.																												
North Belle Isle, Ne.																								Red Elephant, S.																												
Ontario, Ut.																								Ruby, of Arizona																												
Ophir																								Silver Cliff, S.																												
Plymouth				17.63								17.50												South Bodie, G.																												
Potosi																								South Bulwer, G.																												
QuickSilver Pref., Ca.																								South Hite																												
Com., Ca.																								South Pacific																												
Robinson Cons., Co.																								State Line, 1 & 2, S.																												
Savage, Ne.	2.70																							Nos. 2 & 3, S.																												
Sierra Nevada, Ne.	1.50																							Sutro Tunnel	.18																											
Silver King, Ar.																								Faylor Plumas																												
Spring Valley, Ca.																								Tioga																												
Standard, Ca.																								Unadilla, S.																												
Stormont, Ut.																								Union Cons., G. S.																												
Tip Top, Ar.																								Utah																												
Yellow Jacket																																																				

Dividend shares sold, 17,370. Non dividend shares sold, 16,360.

companies in the combination have been buying outside coal to prevent it from demoralizing the market. Perhaps as much coal will be needed during 1885 as last year, but it should not be produced before there is any demand for it. The only safe way for buyers is to place orders against immediate wants, and this is apparently just what is done at this port.

The f. o. b. quotations at New York continue very low.

There is nothing of importance to note in bituminous coal. Cargo lots are selling at \$3.25@3.35 delivered, with some inferior coals at a less price. Provincial culm is steady at \$2.25@2.30 delivered.

There is no movement in gas-coal. Low rates of freight still rule, quoting 75 cents as a bottom figure at New York. Baltimore rates are \$1.10@1.15. Newport News keeps 10 cents below Baltimore, being 150 miles down the bay from Baltimore. We quote:

New York, 75@90c.; Philadelphia, \$1@1.05; Baltimore, \$1.10@1.15; Newport News, \$1@1.05;

Dividends.

Colorado Coal and Iron Company will pay on and after August 1st the coupons due at that date on the bonds of this company.

Philadelphia & Reading Railroad will purchase on August 10th, at the rate of five per cent per annum, the interest and coupons of the McNeill Tract divisional coal land mortgage bonds.

DIVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF JULY AND FROM JANUARY 1ST, 1885.

Table with columns: NAME OF COMPANY, Location of mines, Paid during month of July, Since January 1st, 1885. Lists various mining companies and their dividend payments.

S., Silver; L., Lead; G., Gold; C., Copper; M., Mica.

ASSESSMENTS.

Table with columns: COMPANY, No., When levied, Delinquent in office, Day of sale, Amount. Lists assessment details for various companies.

Pipe Line Certificates.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report for the week as follows:

The oil market has been bullish through the week, the highest price being 100 1/2 and the lowest 98 1/2. The situation in the oil field is also bullish, as the old wells are declining gradually, and the new wells are not large. It will take a genuine "wild-cat" well to change the present situation.

COAL STOCKS.

Table with columns: NAME OF COMPANY, Par value of shares, Quotations of New York stocks based on the equivalent of \$100 Philadelphia prices are quoted so much per share. Lists coal stocks and their market prices.

* Of the sales of this stock, 2,718 shares were in Philadelphia and 6,150 in New York. Total sales, 158,141. † The quotations for these stocks are not percentage, but actual price.

are a constant tax on holders and a dragging market is likely to tire them out and inaugurate a selling movement. It is not probable that it will get a severe break, and, upon a decline of a few cents, fresh buyers will come in.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

Table with columns: Opening, Highest, Lowest, Closing, Sales. Shows market data for August 1st.

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, Aug. 5.

There has been but little doing in copper stocks the past week, and prices are without material change. In Calumet & Hecla, about 60 shares have changed hands at \$200. A lot of three shares only sold at \$201, and the market closed barely steady at \$202 asked, no bid.

In silver stocks, there is an absence of orders to buy, almost every one wanting to sell, and under such circumstances, there is not much show for business. In one or two stocks, there is a little inquiry.

3 P.M.—There was no feature to the market this afternoon, and quotations are practically unchanged.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to August 5th:

Table with columns: To, From Philadelphia, From Baltimore, From New York shipping ports. Lists freight rates to various ports.

* And discharging. † And discharging and towing. ‡ 3c. Per bridge extra. § Alongside. ¶ And towing up and down. ** Below bridge.

San Francisco Mining Stock Quotations.
Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS.					
	July 31.	Aug. 1.	Aug. 3.	Aug. 4.	Aug. 5.	Aug. 6.
Albion.....						
Alpha.....						
Alta.....	.35	.40	.40	.40	.40	
Argenta.....						
Bechtel.....						
Belcher.....						
Belle Isle.....						
Best & Belcher.....	2.12½	2.25	2.25	2.25	2.25	
Bodie.....	1.62½	1.62½	1.62½	1.62½	1.62½	
Bullion.....						
Bulwer.....						
Chollar.....	1.00	1.12½	1.12½	1.12½	1.25	
Con. Pacific.....						
Con. Cal. & Va.....	1.87½	2.00	2.00	2.00	2.12½	
Crown Point.....	1.12½	1.12½	1.12½	1.25	1.25	
Day.....						
Elko Cons.....						
Eureka Cons.....		5.50				
Exchequer.....						
Gould & Curry.....	1.37½	1.50	1.50	1.37½	1.37½	
Grand Prize.....						
Hale & Norcross.....	5.25	5.62½	5.62½	5.87½	6.12½	
Independence.....						
Martin White.....						
Mexican.....	.85	.90	.90	.85	.90	
Mono.....						
Mount Diablo.....	1.37½	2.00				
Navajo.....	.90	.90	.90	.90	.90	
Northern Belle.....						
North Belle Isle.....						
Ophir.....	1.25	1.37½	1.37½	1.25	1.25	
Overtman.....						
Potosi.....	.35	.30	.30	.30	.35	
Savage.....	1.87½	2.37½	2.37½	2.50	2.62½	
Scorpion.....						
Sierra Nevada.....	1.37½	1.37½	1.37½	1.37½	1.50	
Silver King.....						
Tip-Top.....						
Union Cons.....	.75	.85	.85	.80	.85	
Utah.....			1.25	1.25	1.12½	
Wales Cons.....						
Yellow Jacket.....	1.50	1.62½	1.62½	1.75	1.75	

MAPS.

ARIZONA AND NEW MEXICO.—This map shows all the Township Surveys, Private Land Claims, Post-Offices, and Settlements. It also exhibits the Explorations of other Government and Private Expeditions, including the facts developed by the Surveys for the Routes of Projected Railroads, etc., 1881. Scale, one inch to thirty-three miles. Colored, 24x17 inches. Pocket form, \$1.

COLORADO.—Cannon's Map of the Mineral Belt of Colorado. Taken from the Records of the Surveyor-General's Office, and other reliable Official Sources. Showing, in colors, the Mineral Belt, Gold Districts, Silver Districts, Coal Districts, County Lines, and Boundaries of Land Districts. There are also given the Capital, County Seats, Township Lines, Railroads, and Projected Railroads. Scale, 1 inch : 10 miles. Size, 26x30 inches. Pocket form, \$1.50; as a wall-map, \$2.

COLORADO.—Topographical and Township Map of the State. Compiled from U. S. Government Surveys and other authentic sources, by Louis Nell, Civil Engineer. By means of symbols, the following mass of facts is graphically shown: Railroads in operation; Railroads chartered or in progress; Wagon-roads; Wagon-roads proposed; Trails; Drainage dry during the greater part of the season; County-seats; Post-offices; Villages; Townships subdivided; Townships surveyed in outlines; Contour-lines, with vertical intervals of 1000 feet; Altitudes in feet above sea-level, by barometer observations and by spirit-levels; Private grants; Military reservations; Indian reservations ceded to the U. S. Government; Arable land, with irrigation. Tables of Areas of Counties; Astronomical Positions; Arable Land. Scale, 1 inch : 10 1/2 miles. Size, 31x40 inches. Pocket form. \$1.50 on thick paper.

IDAHO.—The Wood River Region of Central Idaho, giving the first correct Geography of that recently explored and remarkable Belt of Discoveries of Gold and Silver Mines on the tributary streams of the WOOD and LITTLE WOOD Rivers, on the Upper Waters of the SALMON RIVER, among the SAWTOOTH MOUNTAINS, and on the Forks of the BOISE RIVER; embracing the Mount Estes and Custer Mines on the north and the Oregon Short Line Railroad on the south. Prepared by Frank J. Scott. Scale, 5 miles to the inch. Size, 15 x 26 inches. In paper pocket. Price, \$1.

MEXICO.—Map of Mexico. Showing Railroads, Broad Gauge and Narrow-Gauge, Constructed; and Railroads, Broad-Gauge and Narrow-Gauge, Proposed. This very large and finely-engraved Map, constructed originally by the government for official purposes, contains all the information obtainable by it, and shows minutely the towns and villages of the entire country. Scale: 26 2/3 Mexican Leagues to the degree, and 69 1/6 English Miles to the degree; also, Kilometrical Scale. 1881. Size, 53x41 inches. Printed in colors. Pocket form, \$5.

NEW SECTIONAL AND MINERAL MAP OF UTAH.—Pocket form. Compiled from the latest U. S. Government Surveys and other authentic sources, exhibiting the Sections, Fractional Sections, Counties, Cities, Towns, Settlements, MINING DISTRICTS, Railroads, and other internal improvements. Scale, one inch to eight miles. Colored. 1884. \$3.75.

SAN JUAN MINING REGION (COLO.).—Kibbe's Geographical and Geological Map of the San Juan Mining Region. 1881. Shows county lines, wagon-roads, stage routes, trails, railroads, cities and towns with post-offices, camps with post-offices, reduction-works, mountain peaks, continental divide Also (by colors), eruptive rocks, Carboniferous, Cretaceous, Jura Trias. Elevations above sea-level. Scale, one half inch to the mile. 22 x 27 inches. Includes, on same sheet, a reduced Map of the State of Colorado. Printed in colors, with board covers. \$1.50.

SAN JUAN MINING REGION (COLO.).—Stockder's Map of San Juan Mining Region, compiled from U. S. Surveys and other Authentic Sources. 1881. Shows county boundaries, district boundaries, wagon-roads, trails over mountain passes from river basin to river basin, continental divide, timber-line (11,000 to 11,500 feet above sea-level), etc. Scale, 1 inch to the mile, or 1 = 63,360. 28 x 38 inches. Pocket form, stiff paper cover, \$1.50; or as a wall map, \$1.50.

COLORADO.—Topographical and Township Map of Part of the State, exhibiting the San Juan, Gunnison, and California Mining Regions. By Louis Nell. Substantially same as above. Post-offices, March 1st 1880. Scale, 1 inch : 9 miles, 1-570,240. Plain sheets for wall, 90 cents.

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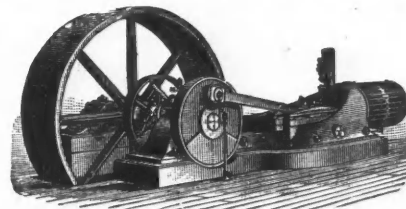
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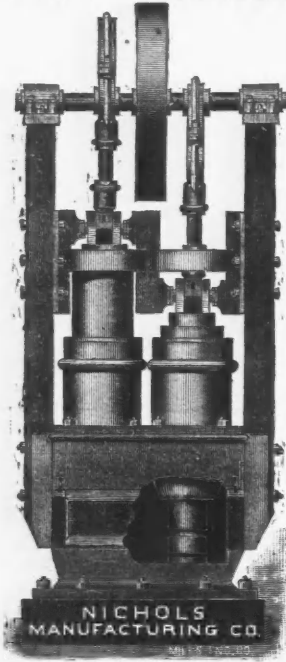
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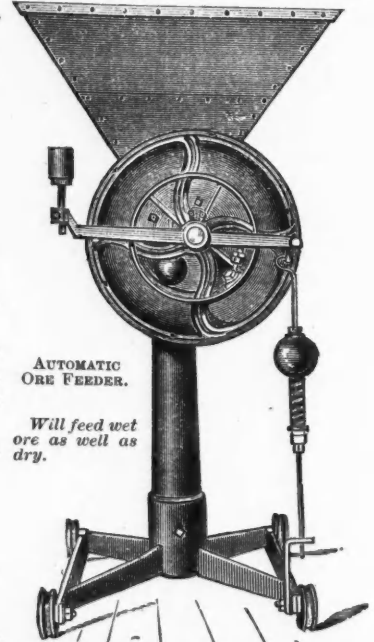
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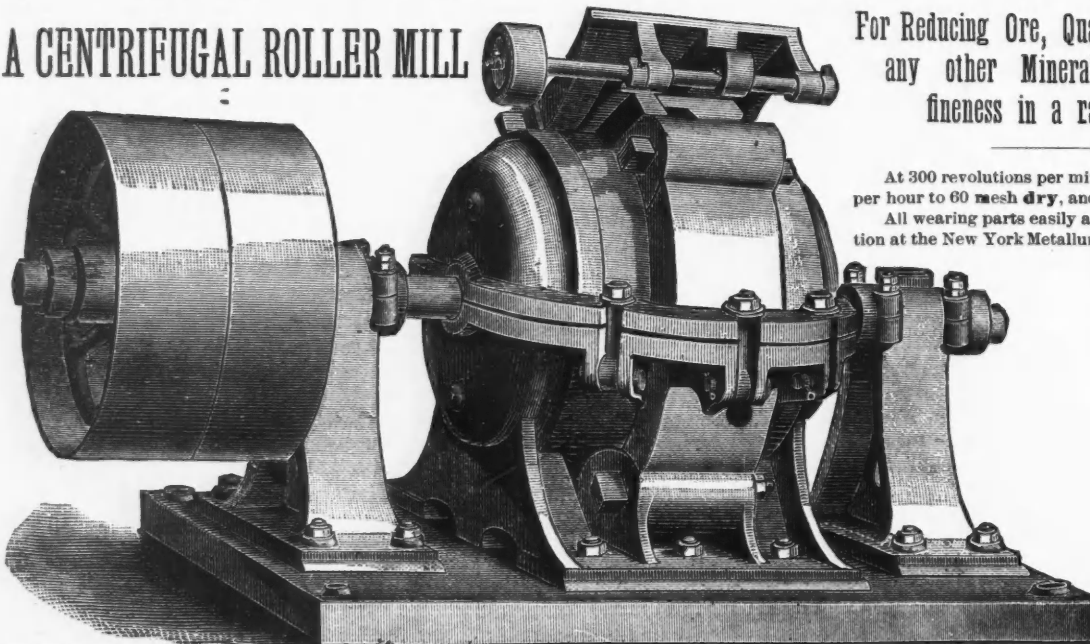


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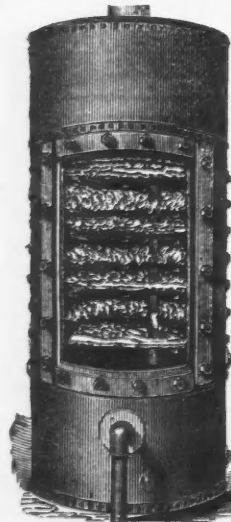
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