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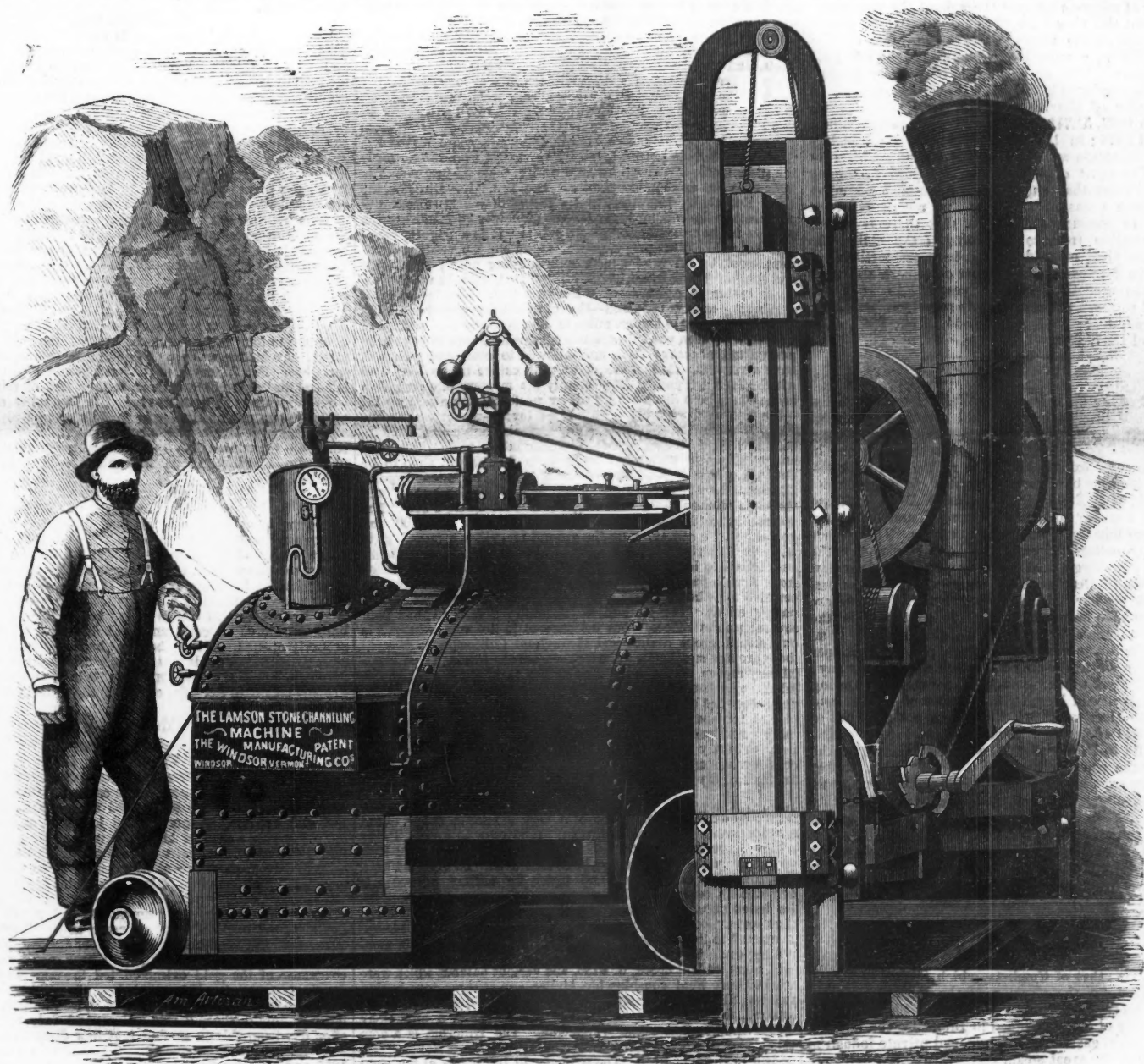
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STONE CHANNELING MACHINE.

The machines now used for quarrying marble, slate, sandstone and grindstone rock, sinking shafts, opening mines and tunnels, are just now receiving more than usual attention. Manual labor in mining and quarrying operations is being superseded by mechanical devices, and these accomplish the work expeditiously and in a much more economical manner. The annexed engraving represents one of these labor saving machines known as the LAMSON Stone Channeling Machine, which has but recently, been brought to a high state of perfection.

dred blows of one drill. The crank shaft is attached to the crown of the bow spring, having the two ends thereof downward, and connected together by links of steel. Midway of these links, by a suitable arm, is attached the gang of drills, which gang is propelled against the rock by the operation of the said crank, like an arrow by a bow string, and drawn back again as the crank revolves. The great improvement of the LAMSON Machine consists in interposing between its driving and striking parts, this elastic bow spring with its flexible links. Unlike other machines, it thereby projects the drills against the rock, instead of letting them fall simply by the

at that instant it is so arranged, that the spring shall be in equilibrium, so that the tremendous concussion caused by the blows does not communicate to the driving parts, to shake the same to pieces, whatever may be the rapidity and force of the striking. The drills, eight or ten in number, without corrugations, serrations, or mortises, are firmly clamped together in gangs by head and foot clamps, which are held in their relative position in such a manner that they can be lowered to cut deeper, or removed to be repaired, without much waste of time. All the fixtures are of the best wrought iron and steel. The drills are plain bars, and the gangs are thereby as much



LAMSON'S PATENT STONE CHANNELING MACHINE.

Numbers of these machines are now in successful operation in the marble quarries of West Rutland, Vermont, where they are doing twice the work at half the expense of other machines formerly in use and it is claimed that they have doubled the production of marble in that State. They are without straps or belts which are known to break continually by wear, or rot from the effects of the weather. Three persons are required to operate one of these machines but the work done is said to be equivalent to the labor of over one hundred men, as in some cases two hundred feet of channel in marble can be cut in one day. Each machine consists of a portable steam engine and boiler of five horse power, driving a shaft having two cranks, one upon each end, to each of which is connected by means of a shaft and bow spring, a gang of ten drills, which are thereby hurled against the rock about one hundred and twenty times per minute, being equivalent to twenty-four hun-

power of gravitation; neither is it restricted in the speed of its driving crank. Gravity cannot be hastened, and if too much speed is given to the driving parts of such a machine, the result is that the gang is arrested and caught up before it strikes, thereby producing no effect, except the usual breaking of the connecting parts. No speed, however great in this machine can prevent the striking of the gangs, and the greater the speed, the heavier will be the blows. Nor is there liability of breakage, for should the drills from any reason bind in the deep channel cut, the elastic and flexible motion of the spring and links relieves the strain otherwise caused by the positive action of the driving shaft or crank. But the greatest advantage of interposing the said bow string and links between the driving shaft and the drills, is, that by this device, the driving and striking machinery is practically disconnected from each other at the instant of striking; for

stronger, as they are cheaper in their particular mode of construction. The machine is made to move along the track by the force of its own friction without the use of cogs; a simple device being added when required, that will permit it to be moved up and down inclined planes. It is simple and compact; measures but eight feet in length, and feeds forward or backward, at pleasure, by hand or power, and with or without motion of the drills. The full and exclusive right and liberty of making, constructing, using and vending these Machines to others to be used, has been secured to the Windsor Manufacturing Company, Windsor, Vermont, in virtue of Letters Patent of the United States, issued April 22, 1856; Dec. 19, 1865; October 2, 1866; March 26, 1867, and Sept. 17, 1867. By the first named Patent, was granted, the exclusive right to channel rock by the use of cutters which have two combined movements, viz:—a longitudinal movement in the line of the

call on good stock collateral, at 7 per cent, and exceptional transactions are made in large sums, upon government securities, at 6 per cent. Strictly first class commercial paper is placed at 7 1/2 per cent per annum discount.

The official report from the United States Mint at Philadelphia shows the amount of money coined during the month of March to be \$351,691, of which there were gold coins to the amount of \$205,650, silver \$22,521, and the balance in copper coinage.

The following will show the exports of specie from the port of New York for the week ending April 18, 1868:

Table showing exports of specie from the port of New York from April 14 to April 18, 1868. Items include Silver bars, Mexican silver and gold bars, American silver, and Steamers with various destinations like Havana, Santiago, and Panama.

Summary table for the week ending April 18, 1868, showing 'Total for the week' at \$1,625,498 and 'Previously reported' at \$16,897,258.

Total since January 1, 1868. \$18,822,736

Same time in 1867. 7,960,245

The shipments of treasure from San Francisco from March 1 to the 10th, was as follows:

Table listing treasure shipments from San Francisco from March 5 to March 25, 1868, including destinations like Nevada, Hong Kong, and various ports in the Pacific.

Total since March 1, 1868. \$2,824,494.32

Previously this year. 6,268,392.93

Total since January 1, 1868. \$8,592,887.25

Corresponding period of 1867. 8,982,334.44

Decrease this year. \$389,447.69

We are indebted to Messrs Platt & Newton for the following financial advice:

Money in California at 1 1/4 per cent, per month, and upon real estate security at 10 1/2 per cent per annum. The few days of fine weather we have enjoyed lately have not been sufficient to restore easy communication with the interior, and we have consequently to report the bullion market as comparatively bare.

Copper—has continued in good demand and the sales of the week are from 1,200,000 to 1,500,000 lbs., at 23 1/4 to 23 1/2 cts for Portage Lake, and 23 1/4 for Baltimore, June and July delivery.

The English market advanced on the 17th instant, to £77 10s., but declined again to £76 for Chill pig copper.

Petroleum—quiet and steady at 12 1/4 cts for Crude, and 26 1/2 to 26 3/4 cts for refined, in bulk.

Receipts for the week ending April 21st. galls. 12,116

Exports for the week ending April 21st. galls. 433,212

Do. from Jan. 1st. do. 11,615,653

Do. same time last year. do. 8,407,945

The following is the quantity exported from other ports, Jan. 2 to April 18: 1868. 1867.

Table showing quantities exported from other ports for 1868 and 1867, listing locations like Boston, Philadelphia, Baltimore, and Portland.

Total Exports from the United States. 7,821,506 galls. 5,910,289

Same time 1866. 19,676,109 galls. 13,829,894

Same time 1865. 14,338,719 galls. 8,996,881

Antimony—Quiet, at 16c. currency.

Bismuth—Fair demand at \$4 per lb. gold.

Nickel—Quiet, at \$1 25 to 2 00, gold.

IN NUMBER, MORE PARTICULARLY ON ACCOUNT OF THE FOREIGN MARKETS, "ALREADY" writes a correspondent of the Guardian.

The market is dull and the sales have been confined to small lots at \$42 to \$45 per ton, and American at \$40 to \$45 per ton, according to quality and brand.

There is no change to notice in pig iron. The market is dull and the sales have been confined to small lots at \$42 to \$45 per ton, and American at \$40 to \$45 per ton.

From Great Britain, tons. 1,573

Lehigh Valley Iron Trade. The following table shows the amount of Pig Iron transported over the Lehigh Valley Railroad for the week ending April 18, 1868, and for the season to that date.

Table showing Lehigh Valley Iron Trade with columns for From (Carbon Iron Co., Lehigh Valley Iron Co., etc.), Tons, and Total.

Exports of Iron and Steel from Great Britain to the United States. The following statement exhibits the quantity of various kinds of iron and steel exported from Great Britain to the United States during the months of January and February of this year, and also the quantities shipped abroad during the corresponding months of last year.

Table showing Exports of Iron and Steel from Great Britain to the United States, listing items like Iron, pig and puddled, Bar, angle, bolt and rod, etc., with quantities and declared values for 1867 and 1868.

STEEL. The demand has considerably improved.

THE COAL TRADE. NEW YORK, April 24, 1868.

Domestic—There has been little or no revival of trade in the wholesale line during the past week; the low price at which Lackawanna coal is selling at retail...

Gas Coals—There is little or no demand for Provincial, and we hear of no new contracts. American is more sought after and we learn of some contracts having been made.

The market continues dull. See quote Locust Mountain, lump, and steamboat at \$3 50; do. broken, \$3 50 to \$3 65; do. egg, \$3 90 to \$4 10; stove, \$4 25 to \$4 50; do. prepared, \$4 50; do. Chestnut, \$4 25.

The movements in foreign coal have been unimportant. English Canal is nominally \$10 per ton; Sidney is scarce and quiet, and Pictou is selling at \$7 50 to \$7 75 per ton.

The following table exhibits the quantity of Coal passed over the following routes of transportation for the week ending April 18, 1868:

Table showing coal quantity for 1867 and 1868 by route, including Phil. and Reading R.R., Schuylkill Canal, Lehigh Valley R.R., etc.

By RAILROAD AND CANAL, FOR WEEK ENDING APRIL 18, 1868.

Table showing coal quantity by railroad and canal for the week ending April 18, 1868, including Schuylkill Coal Trade and St. Clair, Port Carbon, etc.

Cumberland Coal Trade. By R. & O. RAILROAD—The shipments over the Baltimore and Ohio Railroad for the week ending April 18, were as follows:

Table showing Cumberland Coal Trade by railroad for the week ending April 18, 1868, listing Consolidation Company, Borden, etc.

AMERICAN. A Birmingham correspondent writes that the merchants are doing next to nothing on account of the United States.

A good feeling exists among holders of metal, and our present rates, says the Register, they show no disposition to make concessions.

ANOTHER. The market is dull and the sales have been confined to small lots at \$42 to \$45 per ton, and American at \$40 to \$45 per ton.

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Table with columns: Shipper, Week, Total, Grand Total. Includes Savage Mountain, Total, From Eckhart Railroad, C. C. & I Co., etc.

Report of Coal Transported over Lehigh Valley Railroad and Canal

For the week ending April 18, 1868, compared with same time last year:

Table with columns: Shippers, Week, Total, Grand Total. Lists various shippers like Franklin Coal Co., Androsburg, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from B. M. Region like N. Y. & L., Honey Brook Coal Co., etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Hazleton Region like Central Coal Co., Ashburton Coal Co., etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from U. Lehigh Region like Lehigh Coal Co., etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Mahanoy Region like Mt. Rose Coal Co., Mount Etna Coal Co., etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Wyoming Valley Coal Trade.

Wyoming Valley Coal Trade—Statistics for 1866-67.

We are indebted to Mr. W. A. J. Brittain, our correspondent at Beach Haven, for the following statistics, which, although quite late in coming to hand, are very satisfactory, and valuable for reference:

Table with columns: Shipper, Net tons, Net tons. Lists shippers like Butler Coal Co., Mercury & Co., etc.

HOW DISPOSED OF.

Table with columns: Shipper, 1866, 1867, 1868. Lists shippers like Wilkesbarre, Schickshinny, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from West Branch and Susquehanna Canal like Sunbury, Selingsgrove, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Juniata Canal like Juniata Furnace, New Port, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Pennsylvania Canal like Harrisburg, Duncan, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Tide Water Canal like Wrightsville, Salo Harbor, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Wyoming Valley Canal like Wyoming Valley Canal, West Branch and Susquehanna Canal, etc.

Prices of Coal by the Cargo.

Table with columns: Coal type, Price. Lists prices for Schuylkill R. A., Lehigh, etc.

SPECIAL COALS—DEALERS' QUOTATIONS.

Table with columns: Coal type, Price. Lists prices for Diam'd Vein R. A., Locust Dale W. A., etc.

Table with columns: Coal type, Price. Lists prices for Lehigh Lump and Stove, Schuylkill R. A., etc.

Prices for Pittston Coal at Newburgh, April 24, 1868.

Table with columns: Coal type, Price. Lists prices for Lump, Steamer, Grate, etc.

Lackawanna at Rondout, April 24, 1868.

Table with columns: Coal type, Price. Lists prices for Lump, Steamer, Grate, etc.

Lehigh Coal at Elizabethport, April 24, 1868.

Table with columns: Coal type, Price. Lists prices for Lump, Steamer and Broken, Egg, etc.

Wilkesbarre Coal at Hoboken, April 24, 1868.

Table with columns: Coal type, Price. Lists prices for Lump, Steamer, Broken, etc.

At Baltimore, April 24, 1868.

Table with columns: Coal type, Price. Lists prices for Wilkesbarre & Pittston W., Lykens Valley R. A., etc.

At Havre de Grace, Md.

Table with columns: Coal type, Price. Lists prices for Wilkesbarre or Pittston W., Trevorton R. A., etc.

At Georgetown, D. C. and Alexandria, Va.

Table with columns: Coal type, Price. Lists prices for George's Creek and Cumberland f. o. b., etc.

Prices of Gas Coals.

Table with columns: Coal type, Price. Lists prices for Block House, Gowrie, etc.

Prices of Foreign Coals.

Table with columns: Coal type, Price. Lists prices for Liverpool Gas Caking, etc.

Coal Freights.

Table with columns: Coal type, Price. Lists prices for On "Pittston" Coal, etc.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Haverstraw, St. John, etc.

Freights on Coal Sea-borne from Port Richmond, Philadelphia.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from St. John, Portland, etc.

From Elizabethport and Port Johnston.

Table with columns: Shipper, Week, Total, Grand Total. Lists shippers from Albany, Boston, etc.

Rates of Transportation to Tide Water.

To Port Richmond—(Philadelphia.)

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for Lamp, Steamboat, etc.

To Port Johnston.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for L. V. R.R., C. R. R., etc.

To Hoboken.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for L. V. R.R., Morris & Essex R.R., etc.

To Port Richmond.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for From Schuylkill Haven, etc.

To New York.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for From Mauch Chunk to New Brunswick, etc.

To New York via Morris Canal.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for Lehigh Canal, etc.

Expenses from Mauch Chunk to Jersey City for Re-shipment.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for Lehigh tolls, Morris, etc.

Provincial Freights.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for Sydney to N. Y., etc.

Foreign Freights.

Table with columns: Shipper, Week, Total, Grand Total. Lists shipping expenses for New Castle and Ports on Truce, etc.

San Francisco Coal Trade.

The market is well supplied with most kinds; in consequence thereof prices are to a considerable extent quiet. The cargo of 1500 tons English, ex Charles Luling, is being retailed out at \$16 per ton, since reported sold to a dealer upon terms withheld. The invoice of 315 tons Wallaseid, ex Sitas Fish, was sold prior to arrival, upon terms withheld.

SAN FRANCISCO STOCK MARKET.

A telegram from San Francisco, dated April 20, to Messrs. LIES & WALLER, Bankers, 33 Pine street, this city, quotes stocks as follows:

Table with columns: Stock, Bid per Pt. Lists stocks like Gould & Curry, Savage, etc.

New York Imports of Metals, &c.

The following will show the imports of Metals, &c., at the port of New York from foreign ports, for the week ending April 17, 1868. The quantity is given in packages, unless otherwise specified.

Table with columns: Metal, Quantity, Value. Lists imports for Brass Goods, Iron, etc.

THE SPECTRUM OF THE BESSEMER-FLAME.

Since the introduction of the various rapid modes of converting iron into steel, and the extensive application of this, which may almost be called a new material, to many uses wherein iron was formerly used, the efforts of chemists and metallurgists have been excited to constant activity, in still further simplifying and making the process sure and invariable. The most beautiful illustration of the co-operation of sciences is seen in the various observations made by competent chemists on the spectrum of the Bessemer-flame. The great difficulty in that process has been to ascertain the exact point of time at which the decarbonization is complete and the process must be stopped. The change is so minute that the appearance of the flame itself does not show it with sufficient exactitude. But by the observations of LEIBIG, ROSCOE, WATTS and others with the spectroscope, the flame is subjected to a continuous analysis from the commencement of the "blow" to its termination.

The *Chemical News* thus describes the process:

"When the blast is first turned on, nothing is seen but a continuous spectrum. In three or four minutes the sodium-line appears flashing through the spectrum, and then becoming continuously visible; and gradually an immense number of lines become visible; some as fine bright lines, others as intensely dark bands; and these increase in intensity until the conclusion of the operation. The cessation of the removal of carbon from the iron is strikingly evidenced by the disappearance of nearly all the dark lines and most of the bright ones."

Everything that tends to cheapen and perfect the manufacture of this material, is a blessing—and not "in disguise."

SEMI-CENTENNIAL.

The Lyceum of Natural History of New York propose to celebrate their semi-centennial on the 29th of April, the fiftieth anniversary of the day on which their legal existence commenced by the act of incorporation. The history of the society has been marked by periods of great prosperity, and of long-continued depression; but its friends have never permitted its scientific standing to be compromised by affiliating with inferior organizations. At one time it owned a building on Broadway, containing many unique specimens in a fine museum, and it was the most flourishing scientific society in the country. Financial embarrassment deprived it of its building, and the museum was stored on Fourteenth street, awaiting better times; when the unfortunate fire of 1867 consumed the accumulations of so many years. The library—even now exceedingly valuable for European reference—is preserved, and will soon be made accessible to the members. Within the past two years, new life and activity has been infused into this organization; and if properly encouraged its pristine reputation will return. No city in the country is better situated for the growth of a great museum than New York. The exercises of the celebration will be opened by a historic sketch of the Lyceum by Dr. John Torrey, one of the fifteen original members, followed by Pres. Barnard and other eminent savans. The exercises will be held in the great hall of the Cooper Institute.

Original Papers.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]
NOTES ON URANIUM.

By ROBERT HANSCHEL, Mining Engineer, 90 Broadway, New York.

Uranium is a white metal, resembling silver; but it is peculiarly easy of oxidation, burning with great brightness at a low red heat. Of course, then, it does not occur in nature in its metallic state, but only in combination with oxygen, with which it unites in several proportions. The protoxide, UO and the peroxide U₂O₃ are the most common. The minerals containing Uranium are: *uranite*, a hydrated phosphate of lime and the peroxide of uranium, (CaO+U₂O₃) PO₄+8 HO; *chalcocite*, a similar phosphate in which CuO replaces CaO; *uranocalcite*, a hydrated carbonate of lime and protoxide of uranium (of which *voglite* and *liebigite* are varieties); *uranium ochre*, or hydrated peroxide of uranium, U₂O₃+xHO; *samaraskite* or *uranotantal*, containing oxide of niobium, uranium, iron and yttrium, in which the two former bases seem to play the part of acids; *johannite*, or uranic vitriol, a hydrated sulphate of the peroxide of uranium, U₂O₃.SO₃+HO; and, finally, *nasturan*, or *pitchblende* (the *uranpecherz* of the Germans), which is essentially protoperoxide of uranium, UO, U₂O₃, but contains accessory constituents in such quantity that the contents of UO, U₂O₃ seldom amount to 80 per cent.

A glance at this list of uraniferous minerals is sufficient to show that all of them, except the last, occur so rarely and in such small quantities as to be unavoidable for any commercial manufacture. Pitchblende is the only ore of uranium mined for such purposes. The others are sought as mineralogical curiosities. This ore is used in the painting and coloring of glass, enamel and porcelain. In the high temperature of a porcelain-furnace the peroxide of uranium is reduced to black protoperoxide, and is therefore employed for the production of fine black when the colors are "burnt in." The peroxide of uranium gives to glass a beautiful shimmering green tinge. Of late years, the production of pitchblende has been considerably increased, and the manufacture of "uranium yellow" and "uranium orange," has attained considerable proportions. Since the peroxide of uranium is soluble in all acids, and pro-

duces with different re-agents precipitates of various shades of yellow, green, brown and black, it would be widely applied in dyeing and printing but for its rarity and costliness, which are still great, though not so great as formerly.

Pitchblende has very variable characteristics, determined doubtless by the number and variety of its accidental constituents. In color, streak and lustre there is not only a difference among specimens from different localities, but even among those from the same locality. In general terms we may say, however, that the color is pitch-black, greenish or brownish black; the streak olive-green or brownish black; and the lustre resinous. The specific gravity varies from 4.8 to 8, and the hardness from 4 to 6; but NAUMANN classifies these variations, and gives the hardness as 3 to 4 or else 5 to 6, and the gravity as 4.8 to 5 or else 7.9 to 8.

The accessory constituents already alluded to include silica, iron, lead, cobalt, bismuth, arsenic, sulphur, lime, magnesia, manganese, silver, copper and water. Vanadium and selenium were found by WEILLER, STANBERG and KARSTEN in the pitchblende of Saxony, and by PATERA, GOETTL and LINDAKER in that of Joachimsthal.

Joachimsthal (or Joachim's dale) lies about ten miles from the celebrated watering-place, Carlsbad in Bohemia. The silver mining industry of this valley is centuries old; and has a peculiar historical interest for Americans, since the dollar owes to this locality its origin and its name. The silver pieces coined at Joachimsthal obtained the name Joachimsthaler, which was shortened into thaler. The coins of the German empire, or Reich, were called Reichsthaler, which in other northern languages became rix-daler or rix-dollar; and the American dollar is the offspring of this monetary system, and perpetuates the fame of this remote Bohemian valley.

The present mining industry of Joachimsthal includes the production of silver, cobalt, nickel and bismuth; but uranium has become a product of great importance, and the profits of its manufacture bear no insignificant proportion to those of the other metals. Joachimsthal must be considered the principal locality for pitchblende. Durnberg, belonging to the same formation, carries in its argentiferous veins uranium ore of unusual purity, and in such quantity, that the largest of the private mining enterprises at that place, the so-called "Sächsisch Edelleutstollen," (Saxon Noblemen's adit) is made remunerative, in spite of expensive drainage, by these ores alone. The old dumps of Abertham, a small decayed mining settlement, contain pitchblende, and so do the tin veins of Schlaggenwald. Pitchblende occurs also at Marienberg, Annaberg and Johanngeorgenstadt in Saxony. All the localities hitherto mentioned are in the Erzgebirge or Ore-mountains, a mining region which includes portions of Saxony and Bohemia. In other parts of the world pitchblende has been found, but only as a curiosity. Redruth, in Cornwall is given as a locality. The mineral from the west coast of Lake Superior, described by LE CONTE under the name of *coracite*, has been proved by GENTH to be a variety of pitchblende.

The process of manufacture pursued at Joachimsthal is the following:

The finely pulverized uranium ore is first roasted in a reverberatory for the purpose of volatilizing as perfectly as possible arsenic and sulphur, and converting the protoxide of uranium into peroxide. The product is then heated with calcined soda, to produce sodic uranates, vanadates, tungstates and arseniates. The salts of the last three acids, together with the excess of soda, are soluble in hot water, and are now removed by leaching in a filtering-tank. The residuum contains all the uranium and other metals of the ore (i. e., according to its original constitution, more or less, Fe, Ni, Co, Ag, Cu and Bi), and is now diluted to a thin paste by the addition of water or weak uraniferous mother-liquor from previous repetitions of the process itself, and digested with sulphuric acid, as nearly free from arsenic as possible. A little nitric acid is added, to convert into peroxide any protoxide of uranium that may still be present. This operation dissolves the greater part of the metallic contents; and the residuum, consisting mainly of silica, iron, (silicate) lime (sulphate) and traces only of uranium, is separated from the solution by filtration. The filtrate containing sulphates of uranium and other metals is treated with an excess of carbonate of soda, which precipitates all the metallic oxides, but re-dissolves the uranium as a double salt—carbonate of the peroxide of uranium and soda. This solution of the carbonate is pure, if the carbonate of soda employed contains no bicarbonate, and is used in not too concentrated form, and not too great excess. Otherwise, a portion of the iron is also re-dissolved; but the uranium solution is always heated in a copper kettle, and any iron which may be present is precipitated.

From the purified solution of carbonate of uranium and soda the light uranium yellow, (Na O, U₂ O₃ + x HO) is precipitated in a tank by means of caustic soda, separated from the mother-liquor by conical linen filters, pressed, dried, washed again, to free it from adhering glauber salts (Na O, SO₃) and carbonate of soda, dried again, powdered and put up in paper packages.

When orange-colored uranic potassa (KO, U₂ O₃ + x HO) is manufactured (which is done only when specially ordered by customers) the ore is roasted with potash and saltpeter, and treated as before. After the removal by leaching of the soluble salts of potassa, and solution of the uraniferous residuum in sulphuric and a little nitric acid, a solution of carbonate of

uranium and potash is obtained by means of carbonate of potash, and the uranium orange is precipitated with caustic potash.

The cost of producing uranium yellow is about six Austrian florins (nearly \$3 gold) per lb. As it is never sold for less than twenty florins (\$10) per lb., the margin of profit is very large.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]
NITRO-GLYCERINE AT FREIBURG.

By L. H. MITCHELL, Mining Engineer.

Although the invention of nitro-glycerine may not effect a revolution, it will, however, in my estimation, mark at least an epoch in the history of explosive agents.

The German, though slow to act, yet untiring and exhaustive in action, has already seized upon this newly discovered force, and may eventually succeed in so controlling and directing, as to make it, upon economical grounds, a substitute for gunpowder in the working of quarries and mines.

It will certainly be very interesting, if in no great degree beneficial to the reader, to lay before him the results of a series of experiments lately made with nitro-glycerine in the mines of Freiburg, Saxony, and reported in the Freiburg *Jahr-Buch* (Year-Book) of 1867.

These experiments were instituted in four of the principal mines of the district, and carried out with great care and completeness, during the years 1865 and 1866.

I will first present the advantages which result from the use of this explosive agent as compared with that of gunpowder. They are in the main as follows:

1. In order to blast away a given mass of rock in a given time, a less number of miners is required; or, in other words, with the same number of men, less time is required.
2. On account of the less number and depth of drill-holes necessary to produce the same effect, there is a consequent saving of expense in the wear of steel and iron, as also in the cost of repairs.
3. Various kinds of blasting materials, such as priming needles, tamping irons, etc., are no longer necessary; but of course a requisite supply of patent cartridges and fuses takes the place of these, and thus far, it appears, are somewhat more expensive.
4. The charging of the drill-holes is effected easily, quickly, and safely.
5. In the case of rock, impregnated with water, the difficulties that stand in the way in the use of gunpowder at once disappear. The drill-holes can be charged with nitro-glycerine, and then, having filled with water, they may be discharged.
6. Drill-holes that have missed fire can be charged again; this, when powder is employed, is either impossible, or, to say the least, attended with great danger.
7. Nitro-glycerine in contact with flame is, indeed, inflammable, but not explosive.

On the other hand, the following evils, connected with the employment of this agent in mines, present it to us, as compared with gunpowder, in a disadvantageous light.

1. When nitro-glycerine receives a violent blow, or shock, it explodes only in the immediate circuit of such blow or shock; while that part, unaffected by the concussion, remains as an uncharged, explosive residue. If, for example, a thin layer of nitro-glycerine be spread out upon an anvil, and then struck upon any given spot with a hammer, it would explode only at the point of contact; while the residue, as yet unchanged, could be exploded at will, by means of repeated blows.

The fact, repeatedly observed in blasting, that, occasionally, a part of the nitro-glycerine does not explode, may have its origin in the above-mentioned peculiarity, if not, perhaps, in its chemically impure state; while, possibly, the shock given by the detonation of the cartridges is not communicated through the entire mass with uniformity and force enough to effect a complete explosion. This property of nitro-glycerine has, of course, an unfavorable influence upon its intended effect, as also rendering it more dangerous, and injurious. That, more especially, the latter inference is a correct one, is shown by the following statement, viz.: the nitro-glycerine that does not explode, is, by this opportunity, generally thrown about upon the surfaces of the rocks, in the form of a thin coating, where it is likely to remain some time, at once a source of danger, and a cause of unhealthfulness. In case of fractured, or fissured rocks, this residue of nitro-glycerine is particularly dangerous. Were it to penetrate these fractures or fissures, and, afterwards, in the process of boring new holes, to receive a blow, or shock, a sudden, unexpected explosion would necessarily follow. It is, indeed, possible that by means of a new arrangement of the cartridges, this incomplete explosion may be partially, if not wholly, avoided. Moreover, the coating of nitro-glycerine, that remains upon the surfaces of the rocks after an incomplete explosion, might, perhaps, be rendered harmless, by merely washing it away with water.

2. Another evil is found in the fluid condition of this explosive agent. In case of horizontal, or vertical borings, this fluidity necessitates the use of cartridges for the oil. The cost of blasting is, of course, thereby correspondingly increased. But even in the case of drill-holes directed downward, it would seem advisable to put the oil in cartridges, or, at least, to line the drill-holes with a coating of clay, properly prepared; otherwise, one is never certain but that a part of the nitro-glycerine may penetrate into cavities, cleavages, or fissures of the rock.

3. An evil lies in the present want of an easy and simple method of testing the nitro-glycerine; in order, thereby, to judge of its purity and fitness for use.

4. The cost of nitro-glycerine—about eight times that of ordinary gunpowder—does not always stand in proper relation to its greater effect. In mines of compact, tough rock, it is found to be disproportionately less effective than in those of soft.

This relation would, of course, be very much changed if, by an extended and continuous use of nitro-glycerine, it could be bought at one-half its present price, or even at a less rate than that.

5. The very active and obstinately injurious influence of nitro-glycerine, as also of the gases resulting from its explosion, particularly in mines, upon the health of the workmen, renders its extensive use, under such circumstances, a matter of question.

Scientific Meetings.

POLYTECHNIC BRANCH OF THE AMERICAN INSTITUTE.

NEW ALLOYS OF LEAD AND TIN—THE COMING ECLIPSE—ANOTHER ASTEROID—SECURING PANES OF GLASS—AGRICULTURAL MACHINE—BIOMETRY—MAGNETISM.

The usual weekly meeting of the above Association was held attended on Thursday evening, April 23d. Professor TILMAN occupied the chair, and during the time devoted to miscellaneous business, introduced some interesting subjects.

Correspondence.

(To insure insertion of Correspondence in our columns the full name and address of the writer must be given.)

The Bulletin Tax.

TREASURY DEPARTMENT, OFFICE OF COMPTROLLER OF THE CURRENCY, WASHINGTON, April 21, 1866.

EDITOR AMERICAN JOURNAL OF MINING:

I enclose, herewith, statement of the value in currency of the gold and silver bullion assayed in the United States, and the tax paid on the same for the fiscal year ending June 30, 1867.

The act of March 31, 1868 "To exempt certain manufacturers from internal tax, and for other purposes," exempts bullion from the tax of one-half per cent. heretofore collected by the Assayer.

STATEMENT of the value in currency of the Gold and Silver Bullion assayed in the United States, and the tax paid on the same for the fiscal year, ending June 30th, 1867.

Table with 6 columns: States and Territories, Collections on gold assayed, Collections on sil. bul. assayed, Cur. val. of g. bullion assayed, Cur. val. of sil. bullion assayed, Cur. val. of g. & s. bul. assayed. Rows include California, Colorado, Idaho, Montana, Nevada, New York, Oregon, Pennsylvania, R. Island, Utah, Washington, and a Total row.

NOTE.—The tax on bullion assayed in New York, Pennsylvania and Rhode Island, was returned from the cities of New York, Philadelphia and Providence.

Manufacturing and Mechanical Notes.

No. XVI.

Diamonds.

Many persons suppose that diamonds are only used in jewelry—for rings and other articles of personal adornment, and that they are really of no essential value whatever in the practical arts.

No. XVII.

Case's Patent Diamond-Pointed Rock Drill.

We have had several inquiries concerning the above useful machine, besides excavating and mining implements in general, and sometimes have been unable to give our patrons such satisfactory answers as we wished respecting the manufacture and purchase of this description of machinery.

More than 2,000 feet have been drilled with one drill-head in granite quartz, and other hard rocks, without the slightest repair, and without showing the slightest wear on the cutting edges of the diamonds, when examined under a strong glass.

ried by two men, and can be adjusted in any desired position, and operated by one man; it will bore holes in any direction, vertical, horizontal, or at any possible angle, or at any distance under water.

Telegraphing by Touch.

A correspondent, a telegraph operator, proposes to have the blind taught to read telegraphic signals by touch and sound, and those who are deaf as well as blind, by touch alone.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men, and Others.

76,331.—APPARATUS FOR SEPARATING ORES AND MINERALS.—Stephen R. Krom, New York, N. Y.

I claim, 1. In machines for separating granular materials of different densities by the aid of intermittent jets of air or other fluid, the passage F, to discharge the lower stratum, either from an inclined or level bed of a double or single machine, as herein described.

76,364.—FURNACE FOR SMELTING LEAD ORE.—David P. Webster, New York, N. Y.

I claim, 1. The method herein described of forming the interior or lining of furnaces, that is to say, by building the bed, walls, and arch of the plastic material herein described, or the substantial equivalent thereof, in the manner shown and specified, and subjecting the same, when formed into shape, to heat, as herein set forth.

76,413.—PROCESS OF EXTRACTING GOLD FROM ITS ORES.—Rudolph D'Heureuse, San Francisco, Cal.

I claim the process herein described for extracting gold, by passing gold-bearing substances, reduced to a fine powder, without previous alloy, through melted zinc, by introducing said substances below the surface of the melted zinc, as set forth.

76,581.—DECARBONIZING IRON.—John F. Allen, Tremont, N. Y.

I claim, 1. Purifying iron from its carbon and other impurities, by causing the molten iron, contained in a revolving cylinder, to pass in the shape of a shower of spray through atmospheric air or other oxygen-bearing gas or vapor passing or being forced through the revolving cylinder containing the iron, substantially in the manner as set forth and described.

76,678.—BOTTLE FOR HOLDING HYDROFLUORIC ACID.—David P. Webster, New York, N. Y.

I claim, 1. The preparation of bottles for receiving hydrofluoric acid, by coating them internally and externally with asphalt of coal tar, or the herein-described composition of gum-shellac and India-rubber, as set forth.

76,676.—SMELTING LEAD ORE.—David P. Webster, New York, N. Y.

I claim the improved process herein described for smelting or reducing phosphores or phosphates of lead.

76,704.—COAL-EXCAVATING MACHINE.—Job Borton, Antrim, Ohio.

I claim, 1. The picks or chisels M' M', sledges M M, and cams c c, operated by shaft II and wheel I, in combination as described, and operating as set forth for the purposes set forth.

Gossip about Minerals, &c.

A. W. Putnam, who has been searching for some time past, under the guidance of a Boston Spiritualist, for buried Spanish treasures at Sedona, Ariz., thinks he has now fairly reached the walls of the enchanted cave.

In 1865 there were nearly thirteen million tons of coal raised from two hundred and eighty-six Belgium mines. About four million tons were sent to France.

The quantity of coal mined in the State of Ohio in 1867 was 42,139,759 bushels, equal to 1,504,670 tons of 2,240 pounds.

California has decided to utilize the antimony found in its silver mines, and hitherto disregarded. Examination of its properties shows that it is much harder than the antimony most common, and therefore better in the manufacture of type metal.

Some time ago indications of gold were discovered on the lands of Colonel Paul McNeil, and others, Pocahontas county, Va. A chemical test has recently been made by Prof. McDonald, of the Virginia Military Institute, who reports that it contains \$5.81 in gold to 2,000 pounds of earth.

The New York Evening Mail says the largest nail manufactory in the United States is located at Bonton, N. J. The building covers six acres of ground. Fifteen hundred cords of chestnut wood are consumed each year in making kegs in which to pack the stock.

The annual consumption of iron in Russia is now set down at 12,000,000 pounds—a total which shows a considerable progress upon former years.

A coal-bed has been discovered in Genesee county in this State. The owners see golden visions.

MISCELLANEOUS.

550 MILES OF THE UNION PACIFIC RAILROAD RUNNING WEST FROM OMAHA ACROSS THE CONTINENT, ARE NOW FINISHED. WHOLE GRAND LINE TO THE PACIFIC WILL BE COMPLETED IN 1870.

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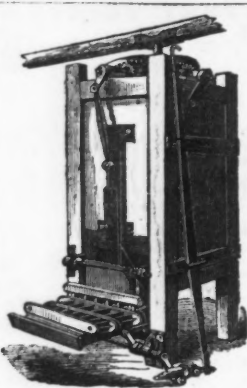
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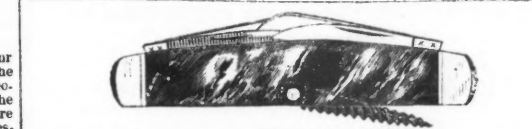
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