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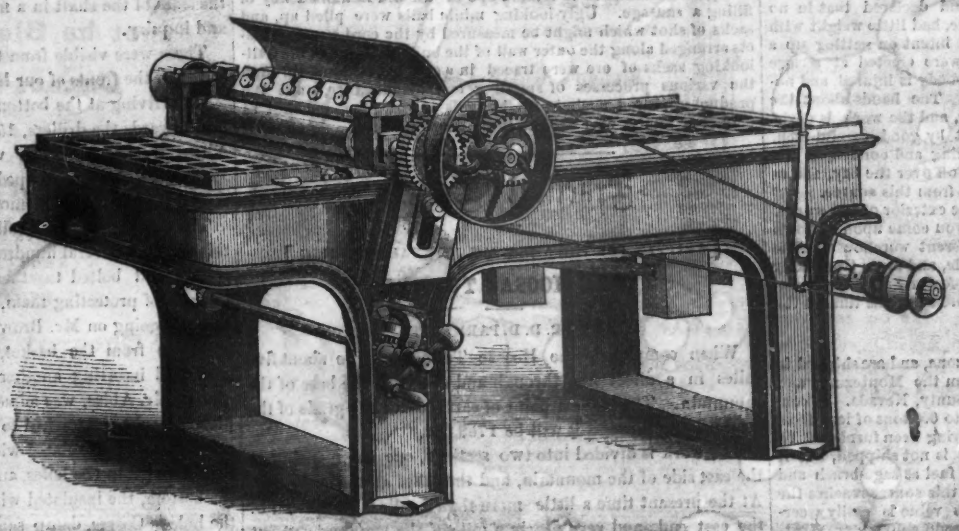
THE "WOODWORTH" SURFACING MACHINE.

This machine is built by HAMPTON & COPELAND, of 89 Liberty Street, New York City. The cut represents a small surfacing machine, with the top feed rolls attached to the cutter head slides, and move up and down with the head. The machine is well adapted for shop work—for carpenters, box makers, and cabinet makers, or any kind of light planing. The frame is made of cast iron, and is heavy and substantial. The cutter head is of wrought iron. The rolls are weighted in a very convenient manner, and will plane stuff to three and a half inches thick, and twenty-four inches wide. The weight of the machine is about 1,400 pounds.

Some of the advantages claimed for these machines are that they are fitted with Burleigh's Patent Expansion feed gears, and with HAMPTON & COPELAND'S Improved Weighted Feed Rolls, which are weighted so that the lumber passes through before it reaches the cutter head, giving at all times an equal pressure in all inequalities of the lumber, which cannot be obtained by rubber springs. The machines are built in the most thorough manner, from the best stock; and it is the intention that they be superior to any in the market.



THE "WOODWORTH" SURFACING MACHINE.

R. HOE & CO.'S LETTER COPYING PRESS.

This Letter Copying Press is a beautiful and useful ornament for the office and counting room. The iron work is elegantly japanned. The arch or yoke is of wrought iron, and the boxes and steps in which the screw works are of brass and finished with great care. When intended for use, the Press is placed on a neat cabinet, which contains all that is convenient and necessary. The lower portion of the cabinet is accessible by a door, and in this closet are placed brushes, water-bowl and other things that would be unsightly upon a desk or inconvenient in its proximity, and for the reception of books, papers, etc. Three neat drawers are provided above the closet. To give room for placing books and letters while in use for copying, two folding leaves are attached to the top of the cabinet, and they can be raised when necessary, and lowered when there is no further call for their services. Three sizes of this press are made, the smallest being with a follower of 10 1-4 by 15 1-2 inches, and the largest with size of follower of 20 by 24 inches.

This Press is one of a great number of patterns manufactured by Messrs. HOE & Co., of 29 and 31 Gold Street, New York City. Their reputation for good and reliable work is so well known that further comment is unnecessary.

Coal Cutting by Machinery.

At a recent meeting of the Institution of Mechanical Engineers, Leeds, a paper was read by Mr. John Fernie, in which the objects to be gained by the application of machinery to coal cutting were stated to be:—First, the cheapening of the work; secondly, the saving of a large quantity of coal, which, in the ordinary process of holing or undergoing by hand labor with the pick, is broken up into slack and dust; thirdly, the removal of the danger attendant upon undergoing by hand labor; fourthly, the getting a larger quantity of coal out of the pit; and, fifthly, in the case of machines worked by compressed air, the collateral advantage of better ventilation and a cooler atmosphere in the mine, owing to the discharge of the compressed air after each stroke of the tool. The difficulties attending the application of machinery to work previously done by hand were said to be greatly increased in the case of coal-cutting machines, by their having to work at great depths below ground, and in the very confined passages of a mine. The writer of the paper described two machines driven by compressed air, one having a pick worked by a bell-cranked lever, with an action like that of the ordinary picks used in handwork, and the other working a straight action tool, somewhat in the manner of a horizontal traversing slotting machine. Both of these machines have now been successfully employed in regular work for a length of time in the neighborhood of Leeds. One of the pick machines does the whole of the undercutting at the West Yorkshire Coal and Iron Company's colliery, at Tingley, holing a seam 3ft. 8in. thick, the compressed air for driving it being supplied by an air-compressing engine at the surface. In a trial recently made with this machine by Mr. Fernie, it was found that a pick of 75lb. weight cutting a groove to a depth of 24in. from the face, gave about seventy-four blows per minute.

R. HOE & CO.'S LETTER COPYING PRESS.

The coal at Tingley is by the pillar and stall system of working, and the time occupied by the machine in undercutting the length of 56ft., forming one pillar, was 25min., including all stoppages. With a pick of 90lb. to complete the previous cut to the depth of 3ft. 9in. from the face, the blows were about sixty per minute, and the half length of 28ft. was undercut in 17min. The time occupied in running the machine back and changing the pick was 16min. From these trials it appears that in undercutting to the depth of 24in. in a single course, the work done was at the rate of about thirty square yards per hour, and in undercutting in two courses to the total depth of 3ft. 9in., the work was done at the mean rate of about fifteen square yards per hour, including the time required for running the machine back and changing the pick. The other coal-cutting machine—which may be described as on the horizontal traversing slotting principal—is the invention of Mr. Donisthorpe, of Leeds. The machine traverses along the working face of the coal, and cuts out a horizontal slot or groove along the bottom of the seam of coal, or along a parting in the thickness of the seam itself. The work regularly done by one of these machines employed at the West Riding colliery of Messrs. Pope and Pearson, at Normantor, is at the rate of 8yds. to 12yds. per hour, including all stoppages, and undergoing the coal to the average depth of about 3ft. 4in. in from the face. At the same colliery the work done by each collier by manual labor is about 0yds. per day of eight hours, undergoing to a depth of 3ft. in from the face. The machine, therefore, performs the work of from twelve to eighteen men.

Its operation has been found so successful that it is now being employed for a very long continuous face of work, and the different parts of the mine are being laid out, as far as possible, for working according to the long wall system for the purpose of obtaining the greatest advantage from the use of the machine.

Solid Lever Bridge.

The Solid Lever Bridge Co. of East Boston have just completed a solid lever bridge for the European and North American Railroad Company, whose road will connect St. John with Bangor, Me. This bridge is designed to span the Costigan Brook. It is the first of the kind ever manufactured, has a span of 50 feet, is 15 feet wide and contains but little more than 5 tons of iron. It is composed of two levers which join in the center and are held in position by means of weight or balance power on the abutments. Upon these is then put a common truss-arch, whose heel centers on or strikes the lever back of the fulcrum, which has the effect of balance power or raising the lever in the center. While on exhibition 27 tons weight were placed upon it, covering a space of 9 or 10 feet, which would be equal to 86 tons or more distributed over the whole space.

The bridge was built by projection, without staging, and is furnished at about one-third the cost of other iron bridges. It is considered by competent judges to be a perfect success. Charles Parker, engineer of the company, designed and superintended the building of this bridge.

The Velocipede Mania.

The velocipede, about which there has been such a mania in Paris for the last year or two, has at length made its appearance in public in New York. Mr. Thomas R. Pickering, the well known patentee of the steam engine governor, of No. 144 Greene Street, on the afternoon of the 17th inst. created quite an excitement in the City Hall Park by appearing there mounted on a two-wheeled velocipede of his own manufacture, just finished. Mr. Pickering went many times round the park, and back and forth in front of the Hall, with great ease, the machine being under the most perfect control and going at a good speed. It astonished us not a little to see with what facility the rider can balance himself and the vehicle, the wheels of which are only three quarters of an inch across the tire, and arranged one before the other. Of course considerable practice is requisite to attain a high velocity.

Lead Smelting and Lead Manufacture on the Pacific Coast.

The San Francisco *Bulletin* says:—It is now nearly three years since the manufacture of shot, lead pipe, and sheet lead, was commenced in this city by T. H. Selby & Co. Very soon after this new industry was successfully inaugurated it was found that not less than *one thousand tons* of bar lead would be needed for consumption annually. Not a pound of this lead was produced in California, although it was known that galena ore existed in the State, and much more abundantly in adjoining States and Territories. For more than two years the importation of lead from France and other European countries continued. The gold went out and the lead came in at the rate of about $120 in gold for a ton of lead, with something in addition for import duties. Miners were in bad luck who struck more galena than silver, and the antimony made matters still worse. Who wanted rebellious ores where there were six parts of lead and antimony to one of silver? The man with a lead mine was stuck. It would not buy the elegant necessaries known in miner's phrase as "grub." In fact, such a mine had no present value because lead ores were not wanted, and it cost more to extract the silver on the ground than the ores were worth.

The proprietors of the Lead Pipe and Shot Works, about a year ago, set on foot a project for testing, and if possible utilizing, these ores. For this purpose two 50-vara lots were procured, beyond North Point, and within a few hundred yards of the Pioneer Woollen Mills. The lots were a little more than a sand spit extending out into the bay, and quite beyond the line of any street or dwelling. The winds blow a gale at that point for nearly nine months in the year, and in a direction to drive any supposed fumes over the bay. Considerable opposition was made at first to the location of the new enterprise, partly by persons who had axes to grind, and partly by persons who didn't own a foot of land in the vicinity, and never expected to be land holders. The fact that lead smelting works had been in operation on the windward side of New York city for 30 years and had never been a cause of complaint, and that Selby & Co., proposed to consume the fumes of their works, and declared that in no event should they ever become a nuisance, had little weight with a few mischief-making spirits, who were intent on getting up a howl, right or wrong. But the works were erected at a large outlay of capital, and it turns out that nobody is injured, and nobody has any valid cause of complaint. The hands about the Smelting Works appeared to be healthy, and the work is desirable enough to make the service sought by good, careful men. The fumes are conducted under the building and condensed in a tank of water. Only a thin vapor passes off over the bay, and as the ores are not arsenical no fume comes from this source.

There is nothing very inviting about the exterior of the works. After winding around the drifting sands you come upon a brown wooden building, looking like an indifferent warehouse. The door is fastened like a millers on the inside, and more than likely the first head in sight will be that of Professor Price, the chemist and mineralogist, who spends some portion of his time at the works.

THE ORES.

The ores are obtained in part from Arizona, and are shipped to this city via the Colorado river; and from the Montezuma and other mines near Orena in Humboldt county, Nevada. A contract has recently been made for from 500 to 600 tons of lead from the latter place, facilities for shipping having been furnished by the Central Pacific Railroad. The rock is not shipped, but is rough smelted near the mines with such fuel as sage-brush and chemistry affords, and so the galena from this source reaches the market in a pretty compact state, and its value is easily ascertained by assays. The ores from the Colorado country are mostly from the Marguarita mine in the Eureka District. These ores come in sacks and have the appearance of dirty pieces of broken rock.

TREATMENT OF ORES.

The ores are first emptied into a hopper having a screen in the bottom, and a pipe of water turned on. After washing they are assorted into three grades and crushed. The ore is put into a wheel having buckets on the inside, and is carried up and discharged into the hopper of the crushing machine, and the crushed mass falling through into a sort of sluice box, the water is again turned on with a strong current to wash away all earthy matter and worthless particles. Appliances not unlike the cradle and "Long Tom" are in use until the bulk of the ore has the appearance of clean gravel, very heavy, and changing from brown to lead color when the ore is very rich. By these processes of concentration, nearly all the refuse matter is parted before the ore goes into the furnace. Some of it is mere pulp, like the sediment at the bottom of a ditch.

THE SMELTING.

The smelting furnaces are not unlike in appearance the low square furnaces used in puddling and forge works, except that there are no draft or blower. A charge of ore is put in, mixed with coal, the ore amounting from one to two tons, more or less, and the whole mass of coal and lead becomes a red conglomerate; pools of lead follow the poker-like streams of claret. The charge is drawn off at stated times, say once in five hours, into a great iron pot sunk in the hearth, with a fire under it to take the chill off. It runs out a fiery stream as red as molten iron, but turns white and crystallizes with great rapidity. The molds are drawn up on little iron carts and filled, the letters which give the stamp being in the bottom of the mould. We have here several bars of metal or crude lead, but really a compound of silver antimony and lead. There may be 50 ounces of silver in a ton of metal, or there may be 150 ounces, or even more. The bars are then taken to another furnace much like the first, except that the heat is lower where the metal is again smelted, and by a nice degree of heat the antimony in time oxidizes and is raked off the surface like flakes of dull-looking clay. In time the antimony is all parted and the oxide lies in a heap, looking as worthless as possible. The metal freed from the antimony is again run into bars which are now a compound of lead and silver, the latter possibly being of the greatest value.

THE PATTISON PROCESS.

The process of parting lead from silver known as the Pattison process, was introduced in England some 40 years ago, and made the fortune of the inventor. A row of pots or cauldrons is set in brick work and heat applied; the lightest metal in time comes to the top and forms crystals, which are skimmed off with an immense skimmer, worked with a crane, and the metals so separated are passed to other pots, until at last the silver and lead are pretty thoroughly parted. The job is then finished by calcining with bone dust, when no more than a trace of silver will be found in the lead, which reappears again in dull-looking bars, ready for the manufacturers' use. The antimony is reduced again from the clay-looking oxide, and appears in bright, brittle bars, which break up with little pressure of the finger. This enters into the composition of type metal; the formula of which is; lead, 80 parts; antimony, 15 parts; tin, 5 parts. Besides the lead turned out, the smelting works can produce all the type metal from Montezuma ore, that needed on this coast.

RESULTS.

So successful have these smelting operations become that Selby & Co., have recently countermanded their orders for further importations of lead; and expect very soon to be able to purchase the quantity wanted for their manufactures at home, which will not fall short of 1,000 tons per annum.

As many as twenty different mining enterprises have been started by the encouragement afforded, and in some instances provisions have been furnished to miners to enable them to continue the work, and the land carriage freight has been advanced to tide water. This is the development of a new industry, if in giving to nearly worthless mines a positive value, employment is furnished to a worthy class of men, and the county is enriched by the development of home industry.

THE SHOT AND LEAD-PIPE WORKS.

Very few persons ever saw the inside of this great manufactory; and there is a notice in the office requesting visitors not to solicit the privilege for their friends to enter the works. There are some processes we presume, which the proprietors don't care to have pirated, as they are improvements introduced at this particular factory. The works turn out annually, say, 400 tons lead pipe; 200 tons sheet lead; 250 tons shot and minie balls, and about 150 tons of miscellaneous articles. As many of the processes at this manufactory have been heretofore described, the particulars are now omitted. The great rollers, which take in a slab four inches thick and four feet square and roll them into thin sheets, were stopped for the day. The shot dropping had also ceased; but the separating and testing processes were going on. The shot were rolled down an inclined wooden plane, with seams or "rifles" so arranged that none but perfect shot would reach the end and drop into the outer box; those having perfect spheres would jump the obstructions and gaps; the rest all fell short and dropped through at various stages on the way, and were taken up for re-melting. Revolving screens separated the different sizes. There were coils of pipe and tubes six inches in diameter, which had been pressed through the dies, with just enough of semblance to remind one of the old-fashioned way of filling a sausage. Ugly-looking minie balls were piled up, and sacks of shot which might be measured by the cord were in closets arranged along the outer wall of the building. Thus the dull-looking sacks of ore were traced in a couple of hours through the various processes of smelting and manufacture, until the product appeared again in bright coils of lead pipe, and shot as perfect as hunter ever used to bring down his bird.

Practical Letters.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]

THE HOOSAC TUNNEL.

BY DR. D. D. PARMELEE.

When completed, the Hoosac Tunnel will be about five miles in a direct line through and nearly at the base of the mountain. The highest point of earth above the grade of the road passing through it will be 1768 feet.

The work is divided into two sections, one commencing at the east side of the mountain, and the other at the west side. At the present time a little more than a mile is completed of the east end, and very nearly a mile of the west end; about three miles are therefore yet to be drilled, blasted, and carried out at the ends of the tunnel, to join the two sections and complete the work. This, it is estimated, will require not more than five years, nor less than three, according to the nature and stratification of the rocks. At the east end the workmen all pass in and out at the main entrance, as there are no shafts.

The drilling is accomplished by compressed air engines brought in through tubes leading from air pumps, which are worked by water power obtained by damming the Deerfield River. The work is progressing somewhat faster here than at the west end, as the rock is not so hard, and much more easily removed. The west section presents more subjects of interest than the east end. It is two miles from North Adams, Mass. The entrance commences in earth, the sides and arch are of brick, which are manufactured close by, from clay a few rods distant.

About 1000 feet from the main entrance within the tunnel drilling and blasting with power is now going on day and night; and here, when the hammering ceases for a moment, the thumping of the drills, 275 feet, through rock, of the workmen engaged in the section further in the mountain, entered by shafts, may be distinctly heard. Returning to the entrance and up the mountain Well No. 4 is reached; this is a shaft 211 feet deep. The drillers whose hammers are heard through the rock are 200 feet from the bottom of this shaft towards the main entrance. The drilling is here performed in the ordinary manner by man power, and the blasting is by power. Ascending further up the mountain we next come to "supplementary shaft" which is 280 feet deep, and the bottom of which is 900 feet from Well No. 4, measuring on the grade of the bottom of the tunnel. Walking further up the mountain we arrive at what is called "West Shaft."—This is 318 feet deep, and the bottom is 300 feet from supplementary shaft. Here are the elevators by which the men and all things employed below descend and ascend. Here too are the machine works, steam engine, air pumps, store houses, etc.

To descend the shaft you put on rubber boots with high tops, an oil cloth wrapper, and water proof hat, to keep out the water dripping down the side of the shaft and to be able to wade the water on the bottom of the tunnel below. From the bottom of this shaft you walk 1500 feet east and come to the drillers, who are managing two engines, mounted on heavy frames, and worked by compressed air. These have three drills each.

The compressed air is forced through large pipes coupled together, leading from the air pumps down the shaft and thence along to the engines; section after section being added as the work progresses. The rock here is very hard and composed chiefly of quartz, considerable portions of which are translucent. Considerable water trickles through the crevices in the sides of the tunnel, and at one place a fountain of cold water jets with much force. This is said to be excellent drinking water. The water is now lifted by steam power at Well No. 4. The quantity is 1000 gallons each minute. When the 275 feet of rock now forming a partition between the two sections are removed, this pumping will not be required, for the water will then flow off at the main entrance.

For compressing air to work the drilling engines, there are four pumps, each having a cylinder 13 in. in diameter, and 24 in. in length, internal measurement. The number of strokes each, a minute, are 80. The cylinders and air are cooled by an ingenious mode of injecting cold water into them.

The occasion of my entering the tunnel was for the purpose of observing the mode adopted there for blasting by Nitro-glycerine, which performance takes place every eight hours night and day. I therefore accompanied Mr. Charles A. Brown, who has charge of everything pertaining to this department, down the shaft. On the platform at our feet as we descended was a basket containing a number of tin tubes, with corks in each, holding altogether 20 lbs. of Nitro-glycerine. This basket I must confess occupied chiefly my thoughts during the descent, notwithstanding Mr. Brown told a humorous anecdote, and a complication of pipes, braces, and bolts, formed the sides of the shaft in a manner naturally exciting attention and inquiry.

These were visible from the light of our tallow candles, adjusted in the fronts of our hats.

On arriving at the bottom of the shaft Mr. Brown took the lead towards the drillers, 1500 feet distant, with the basket of Nitro-glycerine. When we came to the terminus, the machines were soon stopped. Mr. Brown measured each hole drilled, and made his memoranda of the depth.

The two engines were rolled back over the iron rails, laid for this purpose, several hundred feet, and a heavy shield of plank, spiked and bolted together, placed in front of them for the purpose of protecting them, and also the electrician. While this was going on Mr. Brown was taking the tubes of Nitro-glycerine from the basket, one at a time, withdrawing the cork, and inserting another, in which a fuse, made after the plan of Mr. Ables, was adjusted so as to immerse it in the explosive liquid. Attached to these fuses are two copper wires a few feet long, insulated with gutta-percha. The tubes are next inserted in the holes, and pushed with a wood cane to the bottom, the insulated wires projecting a few inches out of the hole. Coarse, damp sand was next crowded down, and somewhat packed until the holes were full.

The two wires of all the fuses were alternately connected to one of the two large insulated wires, which are attached to the sides of the tunnel, and extend about 600 feet from where the blast takes place. The wire at the left was also attached to the other prime wire. All that was now needed was the electric spark to pass through the wires to explode all the cans simultaneously.

We then passed down the tunnel, leaving the infernal apparatus in darkness, to the ends of the prime wires a few feet behind the machines and shields just referred to. Here Mr. Brown connected the two wires to a small Static electrical machine, made of vulcanite, and containing within one of its chambers a condenser. After about six turns of the crank of the machine, the accumulated electricity was discharged, and the 17 pounds of nitro-glycerine exploded at once. As this moment the workmen had receded beyond the shaft, and Mr. Brown had sent an assistant still farther off with the remaining 3 lbs. of nitro-glycerine in the basket.

The shock of the explosion was felt instantaneously with the discharge of the electric current. The deep report was more like what I would imagine would be the effect of the loudest "thunder clap" confined in a like subterraneau alley, than any effect I can think of to compare it with.

I was told that the force of air issuing from the top of the shaft is sufficient, on these occasions, to lift the hats of those near it, and that the vibrations are distinctly felt at the surface, through the nearly 600 feet of rock and earth above the blast.

The use of nitro-glycerine is hastening the work forward. One of the foremen of the shaft informed me that with this, one hole accomplished the removal of as much rock as three holes charged with powder, and in "stopping out bench work," one hole with nitro-glycerine is equal to eight charged with powder, in execution of work.

The nitro-glycerine is made at the Laboratory, constructed for the purpose near the shaft, under the direction of Mr. George M. Mowbray, who has recently made some valuable improvements in its manufacture.

They frequently make here 150 lbs. daily.

On entering the converting department of these works, the first thing that attracts the attention is a long trough, resembling a manger for feeding horses, about three feet above the floor, and fifty feet in whole extension, filled with ice and a little salt.

In this, about two feet apart, are earthen jars holding a gallon each, their tops projecting two or three inches above the ice. In these jars is the nitric and sulphuric acids. Immediately over the jars, two feet above, resting in a wood rack, are inverted cans, holding about one quart of glycerine. This drops into the acid below, where the reaction takes place, and nitro-glycerine is formed, which falls to the bottom of the jar. Mr. Mowbray agitates his acids with cold air. For this purpose he leads the cold air resulting from the partial expansion of compressed air into the Laboratory through iron pipes, and over each jar of acid is a cock to which a rubber tube is attached. On the end of this is a glass tube. During the reaction in the jars, and while dense volumes of nitrous-acid are evolved, and the heat which it is necessary to constantly keep down is rising, his men stir the mixture with these glass tubes, admitting a current of cold air which agitates, cools, and in escaping carries off the gas it is so essential to get rid of, as soon as possible after it is formed.

The next part of the process is the removal of these jars, and the emptying of their contents through a trap or square opening in the centre of the floor, into a reservoir holding about forty gallons of water, for the purpose of washing off all traces of acid. This reservoir is of wood, lined with lead.

After washing the nitro-glycerine, the reservoir, which is balanced on two journals, is turned over on its side gradually, and the nitro-glycerine emptied into glass and earthen receptacles. These are removed to the magazine, a few rods distant.

At the time I entered this magazine, there were one thousand pounds of nitro-glycerine there in jars, holding from three to five gallons each, resting on benches.

Mr. Mowbray prepares his own nitric acid, near by, and also concentrates the sulphuric acid he employs. It is probably by close attention to the qualities of the materials he employs, and the thorough agitation and carrying off of the nitrous acid gas, by the cold air introduced into the jars for this purpose, and also to prevent elevation of temperature, that he succeeds in obtaining the quantity and quality of nitro-glycerine he does. Forty-two pounds of glycerine yields him ninety-four pounds of nitro-glycerine, which, at a temperature of 48 degrees and upwards, is perfectly transparent and without color. A little below this temperature it becomes frozen, and then resembles pounded ice.

The men who are obliged to breathe the smoke resulting from the explosion of the nitro-glycerine in the tunnel, informed me that they experienced very little inconvenience from it, while formerly, when they used the imported article, which was more or less yellow and brown, they were affected with intense headache.

One physical difference, which will be appreciated by chemists, between that imported and that of Mr. Mowbray's make is, that a 12-inch column of fluid nitro-glycerine imported, will expand in freezing 3-4 of an inch in height, while that of Mr. Mowbray's shrinks half an inch. This is supposed to occur from the presence of nitrous gas in the one and an absence of it in the other.

Mr. Mowbray and the electrician, Mr. Brown, informed me that they had made experiments with frozen nitro-glycerine, among which a tin tube was nearly filled with the liquid, and then frozen. Gun-cotton in one case was placed over it; in another, fulminate; in another, gunpowder. To these were attached electric fuses, the tubes placed between heavy blocks of ice, and fired. The result was the driving of the frozen nitro-glycerine out of the tube into the ice, in the form of a candle—no explosion of the nitro-glycerine taking place.

Mr. Mowbray, from this and other experiments, concludes that this agent may be transported quite safely in the frozen state.

There are two routes from New York to the Hoosac Tunnel. One, by the New Haven Railroad to Bridgeport, thence by the Housatonic Railroad to Pittsfield, Mass., then the Pittsfield and North Adams Railroad. The other and quicker is the Hudson River Railroad to Troy, thence by the Troy and North Adams Railroad.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]

On the Ventilation of Coal Mines.—No. X.

BY. J. W. HARDEN, M. E.

THE WATERFALL.

Of the waterfall, your contributor, Mr. Rothwell, tells us, that "Experiments made by Mr. Greenwell, at the Black Boy Colliery, in 1845, showed that the furnace ventilation of 8,394 cubic feet per minute, was increased by the waterfall to 11,565," and he farther says: "This method is applicable in many cases; especially where there is an abundance of pumping power, with an outlet for the water by an adit-level."

Who, amongst practical men, at one time or another, more particularly in the summer, or at a time of low barometric pressure, or on the re-lighting of the furnace or boiler fires, after repairing the shaft, or cleaning flues, or the doing of one or many of the other things contingent, has not caused the launder of the pumping shaft to overflow; or has not run a stream of water through a broom, or into a barrel with holes in the bottom, thereby causing the water to spread, as from the nose of a watering-pot, in order to increase the density of the downcast column? A little water judiciously spread, and continued at such times, has frequently, and in many places, been of very great service. Falling from a 1 1-2 inch tap, fixed in the launder, I have found it to spread so that at 100 yards from the top it has covered the area of a 9 feet shaft; yet I prefer spreading it on its leaving the top, not, however, so that the sides of the shaft catch it immediately. I have known water, let fall in the pumping shaft, to be the only artificial means of ventilation, even where a quantity of fire-damp was being constantly given out, and it answered its purpose; the drag on the air being reduced to a minimum, by the making of capacious air courses. Mr. Vivian, a colliery owner of South Wales, says: "We ventilate our pits by allowing a fall of water through the pumping-shaft, which is the downcast; our engines are five times more powerful, perhaps, than is necessary for the work they have to do, so that the little water let fall does not affect them."

In the Black Boy Colliery case alluded to, there would not only be the accelerating power of the water, but something would be due to the increased vitality of the furnace. Had it been natural ventilation alone, to which the water was applied, the velocity of the current would have been less, but the increase by the water would most probably have been greater.

The employment of the waterfall where there is "an abundance of pumping-power, with an adit-level for the drainage of the pit," as suggested by Mr. Rothwell, is to some of us a new idea.

There are few managers of mines but have experienced likewise some of the incommoding effects of water falling in ventilation where it was not wanted. The accumulation of fire-damp and consequent explosion at the Darley Main Colliery, in Yorkshire, in 1847, I have reason to remember, was caused by drawing water at the upcast shaft, a bad practice at any time; still worse, however, with a falling barometer. I have known a strong current reversed by a jet of water issuing from an orifice, made by the blowing out of an inch and a half of the sheeting of a metal tubed shaft. Yet, though it was at the discharge, it was a stream at the bottom. Not only does water, falling down a shaft, increase the density of the air, it acts mechanically upon it. In natural ventilation, or with feeble ventilating power, and a wet upcast-shaft, it is not at all uncommon—with a rising thermometer on the surface—for the air to stagnate and ultimately reverse, if steps are not taken to prevent its doing so.

Before discussing the relative merits of the ventilating powers treated of, it will not be out of place to say something of the water-guage; a useful instrument, much spoken of in this controversy, and not generally known in the ordinary course of coal mining, and little used, except in the practice of the professional engineer.

It is a tube of glass, bent in the shape of the letter U, each leg being graduated to inches and tenths of an inch, and open at both ends. In furnace ventilation, it is usually fitted in one of the doors of a draft connecting the downcast with the upcast-shaft; the bottom part of it being filled with water, any difference in the height of it, in the two legs, gives the difference in the amount of rarefaction between the air on one side the door, and that on the other, the duplicate door of the drift, being set open. In other words, it shows the amount of drag or resistance the current meets with in its course through the workings of the mine, by being drawn beyond its natural velocity; the resistance being equal to the weight of a column of water the height of the difference of the level of the water in the two legs. Water, weighing in round numbers, 1,000 ounces per cubic foot, the disturbance in inches of that in the guage, multiplied by 52, will give the measure of resistance in avoirdupois pounds per square foot, of the area of the return course the air travels to reach the furnace. But it will not represent the resistance at the furnace, nor that which the air is subjected to, in its ascent of the shaft. In connection with the fan or air-pump, it is fitted at the inlet at the top of the shaft, or to the covering of the machine, or to both; in which case both the drag of the mine and shaft resistance are represented.

An increased height of water-guage is not in all cases an index of increased ventilation; it is, moreover, an index of decrease, hence its great use in detecting accidental obstructions.

I need hardly say that, at the same velocity, the same amount of air cannot pass through small, as through large air courses, yet one will get as high a water-guage through the former as the latter—1,000 feet of air per minute through an aperture a foot square, will give the same height to the water-guage as 100,000 feet per minute will, through an air course 10 feet square. Mr. Brunton, in the North of England, in 1848, with his fan, obtained 9 1-2 inches, representing a resistance of near 50 pounds per square foot, by restricting the air in the downcast.

The measure of the power in a ventilating machine is represented by quantity and velocity; the water gnage is an index only of the resistance occasioned by velocity; the anemometer or powder smoke must be used for the measure of quantity.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]

Lessons on Mechanical Drawing.—No. XII.

BY T. P. PEMBERTON.

GEOMETRICAL FIGURES.

I have hitherto directed the attention of the student to the delineation of straight lines and angles, all of which can be drawn by means of a straight-edge and a lining, or, as it is sometimes called, a drawing-pen. We must now proceed to draw figures which will require the use of both the bow and the lining pen. As there are several valuable books on practical geometry, I do not purpose to describe the construction of the numerous geometrical figures, but shall merely name those to which the student must pay particular attention, and with which he must make himself thoroughly acquainted, as a knowledge of them is indispensable in mechanical and architectural drawing.

Rectilineal figures are those which are enclosed by straight lines. The least number of straight lines that can enclose a space are three. Trilateral figures are enclosed by three straight lines, as equilateral, isosceles and scalene triangles. Quadrilateral figures are enclosed by four straight lines, for instance, the square, rectangle, rhombus, rhomboid, trapezium and trapezoid.

Multilateral figures, or polygons, are enclosed by more than four straight lines. The term polygon, is often employed as a general name for rectilineal figures of all kinds, without regard to the number of the sides, so that the rectilineal figures defined above may, without impropriety, be called polygons of three and four sides respectively.

A figure with five sides is termed a pentagon, with six, a hexagon, with seven, a heptagon, with eight, an octagon, with nine, an nonagon, with ten, a decagon, with eleven, an undecagon, and with twelve sides, a dodecagon.

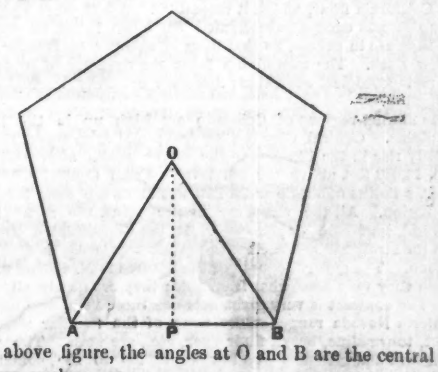
For the purpose of constructing these geometrical figures, the instruments absolutely required are a pair of compasses, a straight-edge or ruler, a lead pencil, pencil and ink bows, and a lining pen.

The student will find some of the figures enumerated above constantly occurring in mechanical drawings, as, for instance, in the case of square and oblong plates, slabs, hexagonal columns, nuts, and bolt-heads, octagonal boxes, for the journals of shafts, etc.; they can all be drawn geometrically in a quick and accurate manner.

In the delineation of hexagonal and octagonal figures the two wooden set-squares or triangles, already described, become useful, since the angle of 60° is the central angle of every regular hexagon, and the angle of 45° the central angle of every regular octagon.

The following table gives the interior and central angles of the different polygons:

Name of Polygon.	No. of Sides.	Polygon Angle.	Central Angle.
Triangle,	3	60°	120°
Square,	4	90°	90°
Pentagon,	5	108°	72°
Hexagon,	6	120°	60°
Heptagon,	7	128° 17′	51° 43′
Octagon,	8	135°	45°
Nonagon,	9	140°	40°
Decagon,	10	144°	36°
Undecagon,	11	147° 47′	32° 13′
Dodecagon,	12	150°	30°



In the above figure, the angles at O and B are the central and polygon angles:

No. of Sides.	Name.	Angle O B P.
3	Trigon,	30°
4	Tetragon,	45°
5	Pentagon,	54°
6	Hexagon,	60°
7	Heptagon,	64°2-7
8	Octagon,	67°1-2
9	Nonagon,	70°
10	Decagon,	72°
11	Undecagon	73°7-11
12	Dodecagon,	75°

The measure of an angle, is an arc of any circle contained between the two lines which form that angle, the angular

point being the center; and it is estimated by the number of degrees contained in that arc.

Note 1.—An arc of a circle is any part of the circumference.

Note 2.—Any figure is equilateral, when all its sides are equal: and it is equiangular when all its angles are equal. When both these are equal, it is a regular figure.

Mining Summary.

GOLD AND SILVER.

Colorado.

PROF. SILLIMAN ON THE PACIFIC RAILROAD AND THE COUNTRY ALONG ITS ROUTE—LARAMIE COAL AND SOME NOTES ON THE GOLD AND SILVER MINES AND THE "PROCESSES" OF COLORADO.

At the last meeting of the Connecticut Academy of Arts and Sciences, held in New Haven, Professor Silliman presented a paper on "Colorado." The *College Courant* publishes the following abstract of his remarks:—"By the courtesy of W. B. Ogden, esq., a party of gentleman who had been in attendance upon the scientific meeting at Chicago, were taken to the extremity of the Pacific Railway, in his private car. They thus had an opportunity of inspecting personally this remarkable enterprise and saw the operation of laying the rails by which it advances at the rate of 25 miles a week. Notwithstanding the cavils in the public prints, the opinion of competent judges, like Mr. Ogden and Professor Eustis, is that the road is remarkably well built. True, pine sleepers are used; but pine is the only timber procurable there, and ties cannot be carried from Illinois. In that dry climate however, it is believed they will last as long as oak ties east. The road is admirably managed, all the trains being controlled by telegraph. It is working now to its full capacity.

On leaving Omaha the traveller rises steadily for 700 miles, attaining at the Black Hills an altitude of 8,300 feet, the highest table-land on the continent, and this so imperceptibly as to be unconscious of it, the grade averaging not over ten feet to the mile. The true dividing line of the continent or water shed, however, is west of this point and not as high; the head waters of the Colorado being 7,200 feet. The hight on the Pacific road is attained without any heavy cut, no rise greater than 85 feet to the mile, and only one tunnel, which is but 300 or 400 feet long. The facility of construction has been much greater than on the western side, where the difficulties have been very great. The road passes through a fine agricultural country and reaches no desert till it comes to Laramie Plains. Here for miles nothing grows but sage; no water can be reached by boring, and the road is obliged to bring it for 70 or 80 miles for its own use. This is one of the most serious difficulties yet encountered; ultimately water will be brought there in pipes from the melting snows in the Medicine Bow Range. The region is also entirely treeless, and wood for fuel is scarce, the few pines and spruces obtained growing in the mountains. This great dearth of wood might be fatal to the road; but fuel has been discovered there in the form of enormous coal beds as extensive as the tertiary fresh water deposits. Over the entire region coal may be looked for, and in many places it has been already found. This coal is not bituminous like that of Pittsburg, but is known as brown coal, and was produced from dicotyledonous plants of our living genera, many of which are well preserved in the shales above. Prof. S. visited these beds and found them from 3 or 4 feet to 12 or 14 feet thick. One at Carbon Station is 10 feet, and one on the North Boulder 14 feet. The roof is of sandstone and the floor of under-clay. The coal is very pure, having been analyzed both by Professor Brush and by Dr. Torrey. The amount of ash is small and it does not clinker. The railway uses this coal entirely. It is not adapted for the manufacture of iron in the high furnace, since it will not coke, nor bear the load. Professors Hall and Marsh, and Dr. F. V. Hayden said the extent of this coal-field was far greater than they had imagined. Prof. Hall thought it was 40,000 square miles in area. The coal is accompanied by a hematite iron ore, which yields iron of a fair quality, when charcoal is used as the fuel.

Colorado was visited by Professor S. from Cheyenne, reaching Denver by a stage-ride of 20 to 22 hours. This town is of recent origin, having been settled in 1860, and is one of the prettiest places in the country. A population of 7,000 is claimed for it, but it is probably much less. Moreover, this number is not likely to increase; for the Pacific road, which, as originally projected, was to pass through Denver, was turned north on finding that a tunnel of a thousand feet would be necessary; and now goes by Evans's Pass. Prof. S. expressed himself as particularly struck by the remarkable agricultural success attained about Denver. The richness of this region is not understood at the east. There, all the cereals and ordinary vegetables, even the tomato, are found growing vigorously at an elevation of 5,300 feet, nearly equal to that of Mount Washington, and this too in a region almost rainless. Nature, however, has supplied the country with a great number of steams, and irrigation is extensively practiced. The wheat is of excellent quality, making a loaf equal to the best California flour, which it resembles. A few years ago, they had no cereals except those hauled 700 miles in an ox wagon; now they are in excess, so that flour is cheaper in Denver than in New York. The cool nights favor the ripening of the grain. The meteorological conditions there are certainly worthy of investigation.

The mining regions of Colorado are high up in the Rocky Mountains. Central City is 8,300 feet; and from there, there is a steady rise in the 12 miles to the silver mines above Georgetown, 14,000 feet above the sea level. From Central City as a center, a radius of a mile and a half would sweep over the main gold region. All the veins are fissure veins, the rocks being granitoid, gneissoid or schistose. In the Consolidated Gregory mine the strata are arranged with perfect regularity, as if for inspection. The general course of the fissures is N. E. and S. W., though they vary somewhat from this; they are nearly all vertical. The contrast is very great between these veins and those of the Sierra Nevada range; there none of the familiar minerals, garnet, tourmaline, beryl, fluor spar, etc., are seen. The veins dip inward and generally at a low angle, 15° to 20°, sometimes 75°, but rarely vertical. In Colorado, the veins are generally vertical, and the variety of mineral species is very great. In a collection found there, nearly all the New England minerals were enumerated. The veins are, in general, copper veins, the minerals being copper and iron pyrites. In all the veins except the galena and blende (black jack of the miners) the gold is uniformly associated with the iron, never with the copper pyrites. It is found most abundantly in the fine granular varities, large pyrite crystals being generally destitute of it. The "tenor" or content of the veins in gold averages for second class ores 1 oz. to the ton; and ranges for first class, from 3 to 12 oz., averaging 8 oz. to the ton.

Colorado is a mining country cursed by "processes." Mills are found in abundance filled with all manner of useless machinery, invented and constructed by men who knew nothing of the problem to be solved. In one notable case, the Lyon process of lead liquation was adopted, when there was no lead in the region; and as a result, $2,500,000 of the $5,000,000 capital of the Consolidated Gregory have been sunk there, the furnace not being worth the bricks used in its construction. Now however the common sense of mining managers is returning, the old and proved methods have been adopted, and the yield is increasing. Nevertheless, the stamps there are badly managed, and the methods of amalgamation are far poorer than in California. Professor Hill is running copper furnaces which produce a regulus containing 50 per cent. of metal (copper carrying the gold and silver) which is shipped to Swansea to be parted. As soon however as enough can be furnished, will be parted there; though no idea of the richness of the country is given by the fact that there is not at present enough first class ore produced to support more than one furnace. The miners are finding out that it is better for them to sell their ores for cash then to attempt to handle them themselves. They bring them to Prof. Hill, who assays them and pays them cash each on the same day, for the gold only, the copper being a perquisite of the mill. The total product in gold of the Colorado region Professor S. stated to be for 1868 not exceeding a probable coin value of one and a half millions of dollars.

The silver region is being rapidly developed. The veins about Georgetown are of galena, the Terrible lode being from 12 to 17 inches wide. Dark red silver ore and fahlerz are the principal silver minerals. Some of the veins are very wide, the filling being very poor. Here too is seen the repetition of the old folly, a mill costing $50,000, with no mine to give it ore. Likewise another mill not far away which cost half million of dollars, and in which the inventor proposed to extract gold by steaming the fine ores with sage brush? But the most mortifying feature was to find, after the mill was completed, that their vein was argentiferous galena and contained no gold. More of these lamentable failures may be seen in one day in Colorado than can be found in a year in any other mining region.

Nevada.

The Comstock—Cahill & Co.'s Stock Circular for the week ending September 11, says: The bullion receipts of most of the mines are equalling those of last month, and the aggregates will foot up about the same. The news received is rather favorable to the development of bodies of ore in the low levels which may return good interest on the investments made. The annexed table exhibits the product of the following mines for August:

Company.	Amount.
Confidence	$17,300
Gold Hill Quartz	6,336
Savage	187,140
Imperial	55,626
Kentuck	165,000
Dollar	99,993
Empire	20,645

The following dividends are reported:

Company.	Aggregate.—Payable.
Savage, $5 per share	$80,000, September 5.
Kentuck, $30 per share	36,000, September 10.

We learn from the Virginia City *Trespass* of Saturday, September 12, as follows, concerning Sierra Nevada Stock, and the second run of the mill: "Sierra Nevada opened at $29, advanced to $30, declined to $26, and closed at $22. The second run of the mill was closed on Monday last, after a run of 300 tons, which yielded a net profit of about $10 per ton. Everything about the mill and mine is in admirable working condition." The *Enterprise* thus mentions the successful use of the patent Root blowers at the works of the leading mining companies, for forcing pure air into the chambers and drifts of the lower levels. "They appear to be just what was needed. The miners are now able to work in comfort in places where the air was formerly so hot and impure that they were hardly able to exist, not to speak of working. Since the setting in of the late spell of cool weather the companies using the blowers have been able to keep their deep workings much cooler than before—so much difference does it make whether the air is warm or cool to start in with. When the cold weather of winter sets in some of the mining companies—the Hale & Norcross for one—intend to furnish air obtained from outside of their hoisting houses—the pure frozen article. Perhaps some Yankee will yet hit upon a plan of congealing the atmosphere and sending it down into the mines in chunks."

White Pine.—The Virginia City *Enterprise* thus discourses of the wonders of this district:—"Some of the mines of White Pine are yielding ores of almost fabulous richness. Parties from that section say it is by no means uncommon to see large lumps of ore that are so near pure silver that by placing a half dollar on them and striking it a blow with a hammer, a perfect impression of the coin is left in the metal. These lumps the miners find no difficulty in disposing of in the crude state for coin. A gentleman from Austin informs us that he saw one lump of ore of the kind mentioned, weighing 40 or 50 pounds, sold by a miner, at the banking house of Paxton and Thornburg, for $300 These rich ores (horn silver) are often found in the very top of the leads and many times projecting a foot or two above the soil. A gentleman who spent some weeks in the district, gives us the following account of its geological characteristics and the facilities for mining. The hill in which these rich ores are found is about three miles long by a mile in width, and is upon the surface of a limestone formation. This limestone is a complete mass of fossil shells, and the deposit is some 400 feet in depth. It rests upon slate, as is seen in places where deep ravines have cut through it. The country rock in the regions surrounding this mountain is principally granite, and the leads found in it contain such a large per cent. of base metals that they are not of much value. Nearly every lead yet found in the limestone range has contained ore of the kind we have mentioned above. Some of the principal leads were at first supposed to run east and west, those who found them being led to that conclusion from the position of the masses of ore found upon and near the surface; but they have now attained a sufficient depth on one or two of the leading mines to ascertain that they run north and south, or nearly so—the masses of ore that appeared to lie in an east and west direction like the croppings of a lead, proving to be but the overflow from the veins, the regular walls being found running north and south. Often the leads are capped over by limestone, and the prospector has only upon the surface a streak of spar to guide him in his search for the coveted mineral deposit. Our informant says that in one place he saw a company of miners blasting away the limestone and following down a streak of spar but two or three inches in width. They had found rich float ore in the ravine below and were confident that it had been spewed up from a vein at the point where the seam of spar appeared, the rock having formed over the lead. They were further encouraged in this belief by the finding of good prospects in silver in the spar and adjoining limestone. A day or two after he visited the spot and found that they had reached their lead, and a blast which they had just exploded in it had thrown out one mass of ore of about 400 pounds weight, which was estimated to contain $1,000 in silver. It appears to be the opinion of the best informed among the miners with whom we have conversed in regard to the White Pine mines, that the veins will certainly continue down through the limestone—some three or four hundred feet. What will be the effect of the contract of the veins with the underlying slate is as yet a matter of conjecture. Whether they will be at once cut off or whether they will increase in richness remains to be seen; however, there will be sufficient ore to last for years should the veins prove to reach no further down than to the slate."

Robinson—Robinson district, which is situated about 45 miles due east from the district of White Pine, presents many singular features in its mineral deposits. It has been only partially explored since its discovery, but it is supposed to contain very valuable property. We find in the *Reese River Reveille* of Sept., 11, a full account of it:—The veins or deposits occur in porphyry, syenite, and limestone-veins were observed in which the gangue was fluor spar. In one of these about eighteen inches thick, large cubes of galena were interspersed through the fluor spar. The galena contains silver, but in what proportion has not yet been tested. On another hill there is an immense ledge, as it is characterized in the district, named the Rio Grande, which was stepped off and found to be 500 feet wide. The great deposit appeared to be a mass of copper ore, and nearly every boulder and irregular shaped piece picked up showed the native metal. Fluor spar is believed to exist in great abundance in the district, and as it is the most valuable flux used in the reduction of copper and others ores, its occurrence will enhance the property of the district. Apart from the presence of ores of silver, copper, and lead, the district contains extensive belts of fine timber, and the prospectors have already discovered substantial sources of water. It embraces within its boundaries and is surrounded by large tracts of valuable land. The Robinson district will be about 100 miles south of the line of the Central Pacific railroad."

Bullion Shipments—The Austin *Reveille* Sept. 11, says: "Yesterday afternoon seven bars of bullion, valued at $8,057 59, were brought into this city consigned to W. S. Gage & Co. They are the product of White Pine ore redneed at the Centenary mill in the district of Newark. . . . . *The Winnemucca Argent*, Aug 27, says of golconda Bullion:—"The shipment on the 15th was one hundred and sixty-three pounds; and on Saturday last another shipment was made of one hundred and fifty-six pounds. In each case sixteen onnces to the pound. The weekly yield has been quite even for some months past. The last was the lowest, owing to the water failing some, and the mill could not be run up to its full capacity."

Idaho.

HUGE BULLION BRICKS—ANOTHER RICH STRIKE—BULLION ASSAYED, ETC.

The Silver City *Owyhee Avalanche* of the 11th inst., is jubliant over some huge bullion bricks, and with good reason. It says:—"We challenge, not only the Territory and Pacific Coast, but also the entire mining world to produce a superior or even an equal to a clean-up made this week at the Lincoln mill, from Ida Elmore ore. Bring forward your figures; we claim the palm for Owyhee. McDonald & Co. assayed the bullion and moulded it into bricks, the total weight of which was 8,351 1-2 ounces, valued at $68,187—quite a snug little sum for one clean up. One of the bricks weighed 1,965 1-2 ounces, worth 22,817, 32, and without fear of impeachment we say it is the most valuable single brick ever produced by a quartz mine. Taking for granted that the aforementioned can't be beat, we'll just mention another that we saw in the lot, weighing 1,825 ounces and valued at $20,671 41. And, if the latter is too large, in the same lot we find a third of 1,642 1-2 ounces, value, $18,389 67.2 We are indebted to Mr. Caldwell Wright, chief accountant at the Lincoln mill for showing us those unparalleled bricks, as they were safely deposited in the office vaults.". . . The same paper thus reports another rich strike. "This week a large and rich quartz vein was discovered in the gulch south of the Pauper mine. Fuit Haight, Hl Gheer and Coggswell are the lucky finders. We visited the discovery on Wednesday and found the quartz to be fully five feet in width, with regular and well-defined casings A considerable portion of the quartz is decomposed and contains large quanities of both gold and silver. We were shown about a dollar in gold and a fine showing of silver obtained from one pan of the decomposed quartz. As soon as the discovery became publicly known, excitement was rife and extensions were located as soon as notices could be written and posted." The following is the coin value of bullion assayed in Owyhee County during the month of August, 1868, as returned to Chas. Hilton, Assistant Assessor of Internal Revenue:

Blake & Co.,	gold—$47,569 39;	silver—$20,520 97
McDonald & Co.,	"—$32,310 22;	silver—$20,698 24
Total	79,879 68	41,219 21
Aggregate		$121,098 89

IRON.

New York.

THE WOODEN RAILWAY AND IRON FURNACE OF CLIFTON, NORTHERN NEW YORK.

A correspondent of the *Montreal Gazette* writes thus of the Clifton Iron district and its tram railway:—"Having recently had the opportunity of visiting, together with a party of friends, the Clifton wooden railway, which has been constructed to give access to a portion of the great unsettled tract known as 'the Northern Wilderness,' of New York State, and believing this road will be found to have solved a practical question of great importance to Canada, viz., that of opening up the interior of the country by the construction of railways at moderate cost, and yet affording reasonable facilities for the transportation of freight and passengers, I give you, according to promise, a brief sketch of our visit. Taking the railway at Ogdensburg, our party left the train at De Kalb Junction, and thence by a carriage which had been provided for us, we were conveyed six miles to the village of Hermon. Next morning we proceeded by carriage one mile to the station of the Clifton wooden railway, and before starting, examined the track with much interest. This road was built for the purpose of enabling the ore from an iron mountain to be made available for use. The inventor and builder of the road, Mr. Hurlbut, is a practical man, who built a similar road, 7 miles long, in another part of New York State, which has been in use for 7 years. The railway is emphatically a *wooden railway*. The rail is of maple, 12 feet long and 7 inches by 4½ in dimensions. The substructure is substantially built in the usual way, except that, owing to the nature of the country, trestle work is very largely used. The ties are round undressed logs, and are bedded into the road bed, or built into the trestle work. The rails lie in niches in the ties, and are fastened by wooden wedges. The wheels of the locomotive and cars (both of which are much lighter than on ordinary roads) are flanged. The country through which the road is carried is so difficult that an iron road was an impossibility, except at an expense so enormous as to preclude its construction. The region is a wild mountainous one, traversed by rocky ridges, deep ravines, and tortuous streams, one of which last the railway crosses over trestle work no less than 11 times in a mile. The grades are necessarily very severe, and the curvatures very sharp, as may be readily understood from the character of the country and the fact that the railway ascends 1,092 feet in 22 miles, the maximum grades being

300 feet. The road is 24 miles long, and reaches from the Ogdensburg Railway to the Clifton Iron beds. Already the enterprise is producing its legitimate fruits, and traffic is being created by it. Clifton village, three miles from the mines, is rapidly growing, and saw mills are busily at work. Here, too, a company have erected a large blast furnace, which is producing 10 tons *per diem* of excellent charcoal pig iron, for which remunerative prices are obtained. Three miles further up are the iron mines, to which the train was conveying a load of fire bricks and lime, to be used in the construction of very extensive steel-works, which are being erected by a New York company. This company have trial works in operation in New York city, and are carrying out a new process, by which steel is made from the ore direct. The ore is of excellent quality, magnetic oxyd, and is found in immense quantity. The ore bed is in fact a mountain, and the ore is quarried with great ease. In addition to the use of the ore by the blast furnace and steel works, a large trade is likely to spring up, in its exportation to Pittsburg, Cleveland, and other places. Having explored, with great interest, the mines, and received courteous attention from General Myres, Colonel Morgan and Mr. Hurlbut, our party returned to Hermon, and took the night train from De Kalb to Ogdensburg, having spent two days very pleasantly and profitably in the excursion. The train down from Clifton carried 4 car loads of iron ore, besides the passenger car, and, although the engine was *sick*, very fair time was made on the journey. It is intended to place more powerful engines on the road. I regard this road as one that will be extensively copied in Canada. For the transport of lumber and other heavy freight, for the conveyance of passengers where moderate speed will suffice, and expense puts an iron road out of the question, the wooden railway will be invaluable. The road in question cost but $7,000, American currency, a mile, and was constructed in seven months' actual working time. In ordinary countries, it could, of course, be built at much less cost, and $5,000 per mile would probably be a fair estimate for an ordinary wooden railroad. The only question that remains is that of durability. Of the durability of the road itself there can be no doubt, and should the life of the maple rail be even less than six years, which Mr. Hurlbut estimates it at, yet the cheapness of this rail and the facility with which it can be from time to time replaced and renewed are so great, that I have no doubt, especially if subjected to a hardening process, that the maple rail will make its way into general use in the class of localities indicated. On the whole, the experiment is a most interesting one, fraught with high promise of usefulness; and I believe that similar roads will ere long be built, so as to connect the interior of Ontario and Quebec with the St. Lawrence, and the system of iron railways on the frontier country. Meanwhile the Clifton railway is a success, and the authorities of the State of New York evinced an encouraging appreciation of a promising enterprise, when they conceded to the company 23,000 acres of (before valueless) land to aid them in constructing the railway, and thereby secured its being built."

Missouri.

Work upon the Iron Mountain Railroad of Missouri is progressing rapidly. Track laying commenced at Bismarck, Sept. 1st, and will be finished to a point four miles below Farmington, within sixty days; and the track has already been laid from Belmont to Charleston. Fifteen hundred men are employed upon the line in the various labors incident to railroad construction; and at the tunnel fifty miles from Bismarck, four sets of hands are constantly employed—two at each end—working night and day. It is estimated that it will require eight months to complete this tunnel, which is twelve hundred feet in length, and that, when finished, the whole work will be completed, and cars will immediately after run through from St. Louis to Belmont.

COAL.

Pennsylvania.

THE SHENANGO COAL MINES.

A letter in the *Christian Intelligencer*, from Shenango City, Pa., says:—"When the collieries were opened three or four years ago, and begun to be worked on an extensive scale, there was, of course, a new point of interest to which the movements of capitalists, miners and laborers naturally tended. The city, which, in 1862, consisted of a tavern, such as it was, and one log house in a wild region filled with forests of timber, overrun with tangled and almost impenetrable masses of laurel and brambles of every sort, in 1866 rose suddenly out of the solitude, and, at the end of a single year presented an array of one hundred and twenty-five houses on side streets well laid out and defined, and cutting each other at right angles in their course from north to south and from east to west. It is impossible for one who has never travelled in the Western States not to be struck by the unique appearance of the city. Next to a new house, or a hotel, for example, is a vacant lot, in which are found charred and blackened stumps in the ground, others uprooted, trunks of dead trees broken off twenty or thirty feet from their base, lying across each other in the most miscellaneous confusion, with piles of brush and the general *debris* of a fallen forest, exhibiting such a scene as only a new city in the wilderness can afford. There are three collieries in the immediate vicinity, in which the male population of the city are chiefly employed. The collieries all operate on different parts of the same vein, at some distance from each other, and in ordinary times have each from 200 to 250 men constantly at work by night and day. The vein is known as the mammoth vein, and is said to be the finest in the country. It is about thirty feet in diameter and as it extends in a generally north and south direction across the whole width of the valley from mountain to mountain, cropping out on each slope about half way to the summit, it is computed that at the rate of working usually practised heretofore, the supply in this one locality cannot be exhausted in less than sixty years."

Preventing Accidents in Mines.

In connection with automatic signalling between those who have the superior control of machinery and those entrusted with its actual manipulation, Mr. Fred. N. Gisborne's name is already extensively known, and one of his more recent inventions—his mechanical engine-room and ship-steering balance-weight signals—has recently been attracting considerable attention in official circles. Under the superintendence of Mr. T. H. Baker, the chief of the engineering department, a model of his new apparatus has just been tested at Chatham Dockyard, with a view to ascertain its applicability to vessels of war, and it appears to have given great satisfaction. It has hitherto usually been considered necessary to employ either electricity or compressed air for forwarding the necessary signals between the bridges, turrets, engine-room, and steering-wheel, but Mr. Gisborne has discovered that these are very objectionable, owing to the heavy cost of keeping them ready for work, and their great liability to derangement; to remedy these evils Mr. Gisborne has invented an apparatus which depends entirely upon mechanical arrangements for its efficiency. The apparatus enables the captain to communicate from the bridge of the steamer to both engineer and helmsman, to receive their replies, and to note the actual movements of both engine and rudder; so that in case of danger from collision at sea during intricate navigation, etc., the vessel is under perfect and immediate control, and can be handled with confidence and safety. As soon as a signal is acknowledged, and before any alteration is made in the ship's course, the engine and rudder-head tell-tales, which are self-acting, instantly indicate upon the bridge, communicating the speed and direction of the engine, and the position of the helm to port or starboard, so that any possible error can be corrected before it has had time to produce any injurious effect.

Appreciating the importance of providing equal facilities for communicating from various points in a mine to the engine-driver, Mr. Gisborne has prepared a modification of his original design in order to render it applicable to mines, and from its extreme simplicity it is well worthy of a trial. The apparatus consists essentially of a balance-chain, working around indented pulleys, each pulley being placed in the centre of a dial, and furnished with an index, the connection being so made that neither of the pointers can move without all the others adopting a precisely similar course. It is proposed to letter the dial "men," "up," "stop," "down," "men," respectively, and whenever either one of the pointers is directed to say "up" the engine-room bell gives the proper signal, and every pointer in the connection is at the same instant turned to "up" also—in fact, the dials may be lettered to suit any kind of wording that may be considered necessary. For economy and convenience it is proposed to substitute, wherever any straight lengths occur, ¼ inch iron rods for the chains; or, perhaps, it would be more accurate to say that the whole of the connections are made with ¼ in. rods, except where the curve of the pulley has to be passed round. As the weights in the engine-room and at the other end of the rods exactly balance each other, the index has no tendency to return to any zero, but remains at whatever point it may be set—a circumstance which it is considered would be of immense advantage in case of an accident, from the facility it would offer for determining upon whom the blame, if any, rested, by affording conclusive evidence as to whether an order had been carelessly given, or had not been properly acted upon.

It is proposed not only to apply these signals in the shaft, but also in incline planes, and in levels, indexes being provided at short distances, so that in case of accidents, such as the trams getting off the rails, the lad in charge can instantly communicate with the engine-man, and prevent the damage which would otherwise be inevitable. The special advantages claimed are that a single connector (composed of ¼-in. diameter rods, with chains at angles) is required to transmit orders and receive replies between any number of communicators and indicators, all of which work in perfect unison; the connecting rods (having balance-weights at each end thereof) take up any slack, or yield to contraction, so that when once fixed they continue self-adjusting, and for like reason they transmit signals steadily, but little power being required to move them; the pointers and transmitting handles of every communicator and indicator can be quickly adjusted to the centre of a common order by simply turning the outside binding screw, which holds them in position. The apparatus is so simple in design, that any ordinary mechanic can fit it; and the cost price is small, and fitting inexpensive.—*London Mining Journal.*

Co-operative Colliery.

The *London Daily News* has the following: Two years ago Messrs. Briggs, of the Whitwood and Methley collieries, worn out with a long series of disputes with their workmen, and reduced to a point when the question lay only between closing their pits altogether, or introducing some totally new system, made the proposal for an arrangement for co-operative working. They offered to the men that, after paying all other expenses, and after securing a rate of ten per cent interest, on the capital sunk, the surplus profits should be annually ascertained, and divided equally between masters and men. It was also proposed that such of the men as thought fit might put their own small savings into the concern, and become shareholders. The proposal was discussed and accepted, and it has been acted on for two years. The second general meeting of the new firm—Henry Briggs, Son & Co. (limited)—was held recently, and the balance sheet for the year was submitted. It was highly satisfactory. After paying the ten per cent. on capital, there was a surplus of seven per cent. to be divided between capital and labor. Every workman shared in this bonus in proportion to the amount of wages he had received during the year. There were about twelve hundred hands employed, and there was more than £3,000 to be thus distributed; therefore there would have been an average of £2 10s. per head, supposing all had equal qualifications and all had worked regularly. As it is, we may presume that the superior skilled workmen received considerably larger sums, and that lads or new hands may have made only a few shillings. But in every case it was pure gain. Those who were shareholders reaped thirteen and a half per cent. interest besides. Those who were not already shareholders were offered a new opportunity of taking shares, and so participating still more largely in future profits. Every one has naturally been satisfied, and strikes have disappeared. This is an eminently encouraging result. The experiment was tried under the gravest difficulties. Not merely had there been long-standing disputes, but there had grown up a permanent bad feeling between men and masters. The men were careless, if not worse, even when they did work, and destroyed more coal than proper working would have required. The masters were upon the point of withdrawing the capital from so losing a concern. Yet in two years not only is harmony restored, but the capital makes thirteen and a half per cent., net, while the men are paid several pounds a year beyond their wages. This result shows of itself how it was brought to pass. Not only did the men work harder, and so better earn their wages, but they worked more carefully, and so saved their master's property and their own.

Gold in France.

A pamphlet, by M. Debombourg, recently published at Lyons under the title of "Gallia Aurifera," gives the following curious details:—Gold in France lies chiefly in the Alps, the Pyrenees and the Cevennes, and the water courses from these mountains are constantly bringing down particles of the precious metal disaggregated from the rocks. Probably there does not exist in the whole country more than one real vein of gold, that in the Gardette (Iscre) discovered in 1700, and worked, up to 1841, at an expense infinitely greater than the produce. The principal gold-bearing rivers of the Alps are the Rhine, the Rhone and the Arve; of the Pyrenees, the Ariege, the Garone, and the Salot; of the Cevennes, the Ardeche, the Ceze, the Gardon and the Herault. The Rhone brings down not only gold dust but nuggets, as it did even in the Celtic period, when the inhabitants found the shining metal on the river banks amongst the sand and pebbles. The auriferous wealth of that river preserved its importance for a long period, and gave rise to a branch of industry called that of the "Orpailleures," those engaged in which the edicts of Louis XI. and Louis XIV. term, "Cueilleures de paillettes d'or." There were orpailleurs at Rache-de-Glun, La Voulte, St. Pierre-de-Bœuf, Condrieu, Givors and Mirabel. In the Michaille and a part of the Gex district the people were accustomed, when the water was low, to seek gold particles on the banks, where they usually found them with little trouble. In 1809 a field laborer at Tronquoy, near Saint-Quentin, struck with his plowshare a large mineral mass which he thought was iron. He took it home, where for twenty years it served as a support to his pot-a-feu, in the fire-place. One day he discovered some yellow streaks in it, and he said to himself they might possibly be copper. A coppersmith to whom he sold it for 2f., could never succeed in melting it, and at last he took the mass back to the peasant from whom he had bought it. A dispute arose, which the Judge de Paix directed to be decided by an expert in chemistry. The latter decided that the article which the seller would not receive back was pure gold, and worth 30,000f. The buyer thereupon redeemed his property, but the other contested the claim, and the case subsequently went before the Civil Tribunal, which awarded the nugget to the finder.

Charcoal Crucibles.

Mr. Gore communicates to the *Philosophical Magazine* an excellent way of making charcoal crucibles, etc. He first shapes the articles out of wood, and he finds that lignum vitæ, kingwood, ebony and beech answer best. After the vessel has been formed, the wood is carefully dried in a warm place. The articles are then enclosed in a copper tube retort having two exit tubes for the escape of gas. This retort is heated slowly at first, and finally for some time to bright redness, to completely carbonize the wooden vessel. It is necessary, Mr. Gore says, to turn the retort continually, and so distribute the heat, that none of the tarry matter evolved may condense upon the articles; otherwise, he tells us, their shape and dimensions may be seriously altered. The heating is to be continued until no gas is evolved, and care must be taken not to heat too rapidly, or the article will fall to pieces. Charcoal made in this way from lignum vitæ is remarkably hard, and the texture is so close as to make it apparently quite impervious to liquids; even after immersion in the strongest hydrofluoric acid the surface had no acid taste. Rods made of this lignum vitæ charcoal, conduct electricity admirably, and would probably, Mr. Gore says, answer well for pencils for the electric arc.

United States Geological Cabinet—Montana and New Mexico Specimens.

The Geological Cabinets of the U. S. Land Office have already begun to respond to the wise forecast of their Founder, the Hon. Joseph Wilson, Commissioner. Packages containing specimens of minerals and rocks valuable in the arts are received almost daily in such profusion and variety as to prove the vastness of the metalliferous and other deposits of the newly-formed States and Territories of the Rocky Mountain Districts. The old California miners were in the habit of saying that the richest deposits of the precious metals were to be found clustered around elevations, which are manifestly connected with either recent or ancient volcanic eruptions. Their views are shown to be correct. No geologist who shall climb the summit ridges of those mountain ranges but will find the older plutonic or eruptive rocks in widespread profusion; more particularly the gold-bearing syenitic granite. The penetrating frosts of winter crumble this rock to atoms, and the melting snows wash the pulverized mass into the valleys, forming the placers which are spread out on the head-waters of all the streams flowing from the flanks of the mountains. Where the Jefferson branch of the Missouri River bends around the foot hills of the great chain, it receives from each small valley a little tributary, which brings its portion of rich earth from above to be deposited as a placer at the first level place, or obstruction it meets with. This remarkable bend in the mountains is now the seat of the new cities of Montana, Virginia, Bannock, and Helena, now swarming with an enterprising and wealthy population. The gold prospector or explorer is a fearless, restless character, much resembling the race of trappers and hunters who formerly frequented those grounds. The early emigrant trains, in 1864, bound for the Pacific, found small parties of them digging and washing on the head waters of this branch of the Missouri, where now three cities flourish. The amount of treasure said to have been extracted from a few square rods by two or three miners in a short summer is almost fabulous—no less than four hundred thousand dollars—and the whole gold product of the territory for 1866 is, by the most cautious estimate, fixed at over twelve millions.

A few short years have been sufficient to develope largely the business of mining. The gold has been traced to its original veins among the hills and spurs. The gold quartz has been mined; crushing mills and amalgamators have been erected, and are now adding largely to the placer yield. California can show no richer specimens of gold quartz than have been recently forwarded from Montana. The rich metal blossoms out of the hard, milk-white mineral, and a crystal, with several sides and angles quite perfect, shows the metal in one of its rare modifications. A large nugget of placer gold has also been received, showing that the rich washings are by no means exansted.

Whilst writing the above, there has been received an addition to the collection, of still greater interest. It consists of a silicious specimen of exceedingly loose texture, through which is interspersed fibres and strings of pure gold, some of which measure over two inches in length. It is reported that an assay of this ore, showing no gold to the naked eye, gave a yield of $19,000 per ton. The locality is on Ute Creek, a tributary of the Cimarron River, in New Mexico. The vein is twenty feet wide, and is locally designated as Mannel's Lode. The existence of such rich deposits in New Mexico was not suspected. They may prove more productive in precious metals than any yet discovered in the United States.

The specimens first referred to are from the mines near Helena, and were forwarded by George McLean, Esq., Receiver of the United States Land Office, and they will be cheerfully exhibited to any one interested in the subject, by Mr. A. K. Roessler, the able and courteous Geologist in charge of the Cabinets.

A telegram from San Francisco says, that further reports of rich gold discoveries in Arizona have been received. Thirty-five thousand dollars' worth of retorted gold from Vulture Mine was received by the last steamer from Los Angles. A company of hydraulic miners have been working a claim near Prescott, which has yielded $15 per day to each hand employed, during several months past. There is some excitement in this city regarding the new mines.

MARKET REVIEW.

FRIDAY EVENING, Oct. 2, 1868.

Gold and Silver Stocks.—The improvement reported in Nevada and Colorado stocks was not continued through the past week. The decline in Nevadas is most noticeable; Twin River is off the market altogether, and. Combination is considered worth only $3 50 by purchasers, holders, however, ask $6 against $8 last week and $10 the week before; Manhattan shows a decline of $5, $100 being the quotation now. Of Colorado stocks the firmness of Consolidated Gregory is the most important feature this week; Smith & Parmelee is likewise worthy of notice in this respect. The market is thus quoted:

	Bid.	Asked.		Bid	Asked
Alameda Silver	.. ..	50	Holman	2	6
American Flag	.. ..	80	Hope Gold	.. ..	20
Bates & Baxter Gold	.. ..	50	Kipp & Bnell Gold	.. ..	25
Benton Gold	25	27	La Crosse Gold	20	25
Bobtail Gold	.. ..	1 25	Liberty Gold	.. ..	4
Bullion Consolidated	.. ..	.. ..	Manhattan Silver	100 00	.. ..
Columbia G. & S.	.. ..	.. ..	Midas Silver	25	75
Combination Silver	3 50	6 00	Montana Gold	54	60
Consolidated Gregory	4 30	4 45	New York	1 00	1 15
Corydon	12	25	Owydee Mining	.. ..	45 00
Gunnell Gold	.. ..	70	People's G. & S. of Cal	.. ..	40
Gunnell Union	.. ..	40	Quartz Hill	98	1 05
Gauss Valley	38	45	Rocky Mountain Gold	5	.. ..
Hamilton G. & S. B.	.. ..	82	Smith & Parmlee Gold	4 95	5 00

Copper Stocks.—Davidson Copper is quoted at 30c.; Flint Steel River at $1 75, and Mendota at $1 50.

Petroleum Stocks.—Sales of United States are made at $2 35. Unions have advanced to $6 50. Some stocks, however, show a decline from last week's quotations. Prices to-day rule as follows:

	Bid.	Asked.		Bid.	Asked.
Bennehoff Run	.. ..	50	Rynd Farm	20	24
Brevoort	75	.. ..	United Pet. Farms	.. ..	.. ..
Buchanan Farm	50	65	Union	6 50	.. ..
Central	45	65	United States	2 30	2 50
National	2 50	3 50	Sherman & Barnsdale	1 10	.. ..
N. Y. and Alleghany	.. ..	2 00	Second National	.. ..	.. ..
Pithole Creek	50	90	Bliven	.. ..	.. ..

Petroleum.—Is dull at 15¼@16c. for Crude, and 30¼@31c. for Refined in bond.

Receipts for the week ending Sept. 29	pkgs. 12,478
Exports for the week ending Sept. 29	gails. 1,478,712
Exports from Jan. 1	gails. 41,047,423
Exports same time last year	gails. 21,951,546

The following is the quantity exported from other ports, Jan. 1 to Sept. 26:

		1868.	1967.
From Boston	galls.	1,924,498	1,567,087
Philadelphia		28,401,987	20,982,989
Baltimore		2,042,775	1,234,726
Portland		568,970	.....
Total		32,938,230	23,788,802
Total exports from the United States		75,736,454	46,081,245
Same time in 1866			44,853,345
Same time in 1865			15,512,240

Copper.—The sales during the past week have been small; they foot up from 300,000 to 400,000 lbs. at 23¼c. for Detroit; 23¼@23¾c. for Portage Lake and Baltimore. The sudden stringency in the money market and the decline in gold unsettled business.

Tin Straits are quoted at 24c.; Banca, 26¼c.; English, 24c.; without wholesale transactions.

Spelter.—We note small sales at 6¼@6 3-10c. for Silesian.

Lead is steadily improving a little; sales of the week foot up 500 tons at 6¼@6 45-100c. for ordinary foreign. Refined is held at 6 70-100@6¾c., gold.

Miscellaneous Stocks.—Western Union Telegraph is quoted at 34; Mariposa Pf., 18½; Pacific Mail S., 112¼@112½; Del. and H. C., 129; Adams Express, 59; Wells-Fargo Express, 31@31½; American Express, 48; U. S. Express Co, 49¼@49½; Mercnant's Union Express, 23@23½; N. Y. Central R. R., 128½; Erie R. R., 49@49½; Erie Pref., 70@71; Hudson R. R., 139; Reading, 94½; Mich. S. & N. I., 85½; C. & N. W. R. R. Pref., 89; Cleveland & Toledo, 101½; Chi. & R. I., 103½; Milwaukee & St. Paul R. R., 95½; Milwaukee & St. Paul Pref., 94¼@95; Tol. W. &W., 59½; Morris & Essex, 65½; P., Ft. W. & C., 108½1 Ohio & Miss., 28½; D. & Sioux C., 95; Delaware, Lack. & W, 121¼.

Government Stocks.—There is little investment movement, either in the way of buying or selling. Our quotations show a marked decline since last week.

U. S. 6s, 1881, coupon	113 @113½
U. S. 5-20s, 1862, coupon	112½ 112¾
U. S. 5-20s, 1864, coupon	109¾ 120
U. S. 5-20s, 1865, coupon	110½ 110¾
U. S 5-20s, 1865, new coupon	107¾ 110
U. S. 5-20s, 1867, conpon	108 108¼
U. S. 5-20s, 1868, coupon	108¾ ....
U. S. 10-40s, ex. coupon	104¾ 104¾

Foreign Exchange.—Exchange is quiet but steady; There is a strictly moderate supply of bills. The bulk of transactions in prime banker's 60 days' sterling are done at 108¼@108¾, but some drawers ask 108¾. We quote:

London (prime bankers'), 60 days	108¾@ 108¾
London (prime bankers'), sight	108¾ 109¼
London, prime commercial	108 108¾
Paris (bankers'), long	5.20 5.18¾
Paris (bankers'), short	5.17½ 5.16¼
Antwerp	5.22½ 5.20
Swiss	5.22½ 5.20
Hamburg	35¾ 35¾
Amsterdam (bankers')	40¼ 40¼
Frankfort (bankers')	40¼ 40¼
Bremen (bankers')	79 79½
Berlin (bankers')	71¼ 71¾

Gold.—The market opened to-day at 139½ but steadily rose to 140¼, declining towards the close of the day to 139¼@140. American silver is selling at 6½@7c. below the price of gold. Mexican dollars are quoted at 102½@103 in gold:

Money is less abundant, in fact, the market is stringent. The banks have little to lend, and the private bankers are employing their balances at the full legal rate even on Governments, and in some cases with a commission added, or even 7 per cent. in gold.

Discounts are quiet. There is but little demand for paper from any source, and the supply is not large. Prime paper of three to four mon hs' time, is generally 7 per cent.

The following will show the exports of specie from the port of New York for the week ending Sept. 26, 1868:

Total for the week	$ 104,468
Previously reported	65,998,946
Total since Jan. 1, 1868	66,103,414

Same time 1867	$42,151,919	Same time 1864	$35,278,802
Same time 1866	58,691,498	Same time 1863	32,517,027
Same time 1865	22,675,762	Same time 1862	42,843,139

THE IRON TRADE.

NEW YORK, October 2, 1868.

Sales have been made of 600 tons No 1 Allentown on private terms; 400 tons Allentown and Thomas at $42; 200 tons No 1 other brands on private terms; 300 tons Grey Forge at $33.

Scotch Iron remains quiet, with small sales of Glengarnock and Gartsherie at $43 50@$44 50.

Sales have been made of Scrap Iron—700 tons, to arrive at New York and Boston, on private terms; 200 tons, Scrap, from Hamburgh, to arrive here; 200 tons to arrive at Boston—all on private terms; 150 tons due here now, at $44.

Old Rails have sold to the extent of 1,000 tons, D H & T S; 200 tons, D H, on private terms; Old Barlow Rails, at $44.

Bar from store is steady at our quotations. The "Telegraph" from Cronstadt for New York, totally lost in the Baltic, had on board 2,000 packs Russia Sheet, mostly light numbers—the market here is without change; Common Sheet is held higher, say 5¼@5½ cents for Singles from store; 5¼@6 for Doubles, and 6@6½ for Trebles.

BOSTON, September 30, 1868.

There have been steady but small sales of Scotch Pig Iron, at $45@$45 per ton, including Gartsherrie, Coltness and other brands; in American Pig, at $40@$45 per ton, as to quality; Bar Iron is firm, with further sales at our quoted sales for English and American; Russia Sheet Iron is quiet at 13@14 cents per lb. gold.

Imports of Pig Iron from January 1st to September 16, 1868.

	1868.	1867.
From Great Britain, tons	15,275	25,491
Coastwise Ports	10,397	7,292

PHILADELPHIA, September 29, 1868.

Pig metal is held firmly, but there is not much activity—sales of No 1 Foundry at $42, and No 2 at $38 50; Scotch Pig is quiet; Manufactured Iron commands $85@$87 50 for Bars; Blooms are neglected.

Lehigh Valley Iron Trade.

Pig Iron transported by the Lehigh Valley Railroad Co. for the week ending Sept. 26, 1868:

From	Tons.	Total.
Lehigh Valley Iron Co	230	8,455
Carbon Iron do	190	6,190
Thomas Iron do	665	21,465
Lehigh Crane Iron do	860	19,865
Allentown Iron do	690	16,425
Robert Iron do	260	7,250
Glendon Iron do	210	17,280
Other Shippers	350	15,457
Total	3,455	112,387

Lake Superior Iron Trade.

Receipts of Ore and Pig Iron at Marquette, up to and including Saturday, Sept. 19, 1868, by the Marquette and Ontonagon Railroad.

IRON ORE.

	Previously reported.	For past week.	Total.
Lake Superior Iron Co	74,741	2,516	77,257
Cleveland Iron M. Co	27,266	1,883	29,149
Marquette Iron Co	7,275	196	7,471
Washington Irou Co	21,321	928	22,249
New England Iron Co	6,102	616	6,718
Edwards Mine	11,444	1,031	12,475
Pittsburg & Lake A. Iron Co	20,528	....	20,528
Ore to Local Furnaces	17,769	1,194	18,963
Total Iron Ore, tons	186,446	8,374	194,820

PIG IRON.

Morgan Iron Co	5,898	....	5,987
Greenwood Iron Co	464	....	464
Bancroft Iron Co	2,679	221	2,900
Collins Iron Co	3,241	164	3,405
Michigan Iron Co	3,485	....	3,485
Total Pig Iron, tons	15,767	385	16,152
Total ore and pig iron, tons	2021.23	8,759	210,972

Imports of Foreign Iron and Steel at New York.

For the week ending Sept. 25.

	Quantity.	Value.
Railroad Iron, bars	29,782	$164,734
Hoop, tons	35	2,653
Sheet, tons	19	1,879
Pig, tons	157	2,069
Other Iron, tons	1,704	42,076
Chains and Anchors, packages	69	2,461
Tubes, packages	1,953	2,602
Steel, packages	4,144	51,588
Machinery	49	3,769
Pipes	....	5,472
Anvils	158	1,425
Wire	5	1,292
Total value		$282,020

Market Prices.

NEW YORK, Oct. 2, 1868

DUTY.—Bars, 1 to 1½c. per lb.; railroad, 60c. per 100 lbs.; boiler and plate 1½c. per lb.; sheet, band, hoop and scroll, 1½ to 1¾c. per lb.; pig, $9 per ton polished sheet, 3c. per lb. Payable in gold.

Am. pig, fy. No 1, best,	$39 00@42 00		Light rls. for mines &c.	
" " 2x frdy,	36 00	38 00	at works	$80 00@— —
" Grey Forge	33 00	35 00	Do. delivered here	83 50 — —
White and Mottled	30 00	31 00	STORE PRICES.	
Pure white for Cal. mar.	31 00	— —	Bar, Swedes, ord'y sizes —	155 00
Scotch Pig, No. I, best bd	43 50	45 00	Bar, Eng. and Am., rf'd.	— — 100 00
" " " ontside,	43 00	— —	Bar, Eng. & Am., com.	— — 90 00
Scrap Iron, ex ship	45 00	— —	Scroll	180 00 175 00
Old Rails	45 00	48 00	Ovals and half round	125 00 155 00
R.R. Iron, For., fm Stock gold	51 50	52 50	Band	180 00 — —
R. R. Iron For., to imp.	50 00	— —	Horse Shoe	180 00 — —
" " Amer. at wks. currency	77 00	— —	Rods, ¼@3-16 inch	165 00 165 00
R. R. Iron, Am., deliv'd	80 00	— —	Hoop	185 00 190 00
Solid Steel rls. For., gd.	110 —	— —	Nail Rod, per lb	9½ 10½
Sti rails of any pattern at works, currency			Sheet, Rus. as'd. Nos. (gold)	13 14
Street Rails at works	80 00	— —	Sheet, s'gle. D & T. com	5½ 6½
			Rails, Eng., gold, ton.	51 00 52 00
			Rails, American	80 00 81 00

English, cast (2d and 1st quality) per lb	18 @23
English Spring (2d and 1st quality)	10 12½
English Blister (2d and 1st quality)	11½ 20
English Machinery	13½ 16
English German (2d and 3d quality)	14 16
American Blister, "Black Diamond,"	10½ 16
American, Cast, Tool " "	16 —
American, Spring " "	10 13
American Machinery " "	— 13
American German " "	10 13

PITTSBURGH, September 26, 1868.

The *Commercial* says: The tone of the market continues buoyant for most descriptions of raw irons. The supply on the market of desirable irons is quite light. The rise in the Ohio increased the receipts very materially, but most of the iron that arrived had been previously disposed of, and would go to fill previous contracts.

In charcoal irons there was considerable inquiry for certain fine grades of forge descriptions, whilst foundry kinds were neglected.

BLOOMS.

The market was firm, with a fair demand and a light stock on hand of the finer descriptions. Inferior and common were but little sought for.

The sales show a large falling off, as compared with the week ending September 19.

We have been requested to state that the 300 tons No 3 Chickies, reported last week at $38, 30 days, was not the product of the Chickies furnace in Lancaster county.

The week's sales were: Anthracite, 700 tons; bituminous coal smelted from Lake Superior ore, 300 tons; charcoal, 240 tons; total, 1,240 tons; blooms, 100 tons.

ANTHRACITE.

100 tons Chickies Forge	$39 00—cash
100 tons No 3 Forge	38 50—4 mos
100 tons No 3 Forge	37 50—cash
20 tons No 2 Foundry	38 00—cash
10 tons No 1 Foundry	41 00—cash
40 tons White	priv terms
20 tons Mottled	priv terms
50 tons Mottled	37 00—4 mos
50 tons No 2 Red Short	39 00—4 mos
50 tons Gray	38 00—4 mos
100 tons No 3 Forge, to arrive	40 50—4 mos
60 tons Neutral Forge, to arrive	40 00—4 mos

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORES.

50 tons Red Short Iron	37 00—4 mos
50 tons Close Gray Iron	39 00—4 mos
100 tons Medium, to arrive	35 00—5 mos
100 tons Medium Gray, to arrive	39 00—5 mos

CHARCOAL IRONS.

240 tons Cold Blast Forge	49 00—4 mos
170 tons Maramec Mo C B	58 00—4 mos

BLOOMS.

100 tons Maramec, Mo	100 00—6 mos

CINCINNATI, September 28, 1868.

PIG.—There is an improved demand, with a firmer feeling in the market. A disposition to buy more freely is evidenced by manufactnrers.

Hanging Rock H. B. Mill	$36	$38 per ton—90 days
Hanging Rock H. B. Foundry	38	40 per ton—90 days
Hanging Rock Cold Blast	53	per ton—90 days
Hanging Rock Car Wheel	55	60 per ton—90 days
Tennessee Cold Blast	40	42 per ton—90 days
Missouri	45	47 per ton—90 days
Jackson (stone coal) Fonudry	38	39 per ton—90 days
Blooms	95	100 per ton—60 days

MANUFACTURED.—Prices have advanced to figures given below:

	B.		C. C.	
Flat Bar	4	4½	5½	5½
Horseshoe Iron	5½	6	6½	7½
Heavy Band	4½	5	6	6½
Round and Sqnare	4	8	5½	9½
Saddle tree	5½	6	6½	7½
Hoop and Light Band	5½	9½	6½	11
Oval Irou	4½	5½	5½	6½
Half Oval and Half Round	4½	5½	6	6½
Angle Iron	5½	6½	6½	7½
T and Hollow Rail Irou	6	..	7½	..
Saw-mill Track	6	..	7½	..
Sheet Iron, 10 to 17	5½	..	8½	..
Sheet Iron, 27	6½	..	9½	..
Boiler-Plate, 3-16 to 5-16	..	..	7	..

IRONTON, Ohio, September 24, 1868.

According to the *Register*, increased animation appears in the metal market, which makes the prices very firm. Holders find no difficulty now in disposing of their metal at quoted rates. The shipments for the week have amounted to about 800 tons; receipts, 580. We quote:

Mill, hot blast	$36 00@37 00
Foundry, hot blast	38 00@39 00
Cold blast	55 00@60 00
Bituminous forge (Belfont)	....@37 00

The demand for bar has become quite good. Rates 4c. Orders for hoop and the smaller sizes of bar are plentiful. We have as yet ascertained no well-grounded indications that the Ironton Rolling Mill go into operation this fall.

Nails are in fair request at $5 for 1vd. The factory is now running its fullest capacity.

Howard Furnace Co. had 200 tons of metal on the Silver Cloud, which sunk at Bellaire last Monday. Metal insured.

The Ironton Foundry continues to turn out a large number of stoves daily, for which a good demand exists.

MILWAUKEE, Wis., September 26, 1868.

PIG IRON.

Arrivals continue to be very light, hardly keeping pace with the requirements of mannfactnrers, while they are using considerably less than was anticipated early in the season.

Buffalo Union, A 1	$49 00
Buffalo Union, B 1	46 00
Lake Superior No 1 (charcoal)	43 00
Lake Superior No 2 (charcoal)	42 00
Lake Superior No 3 (charcoal)	43 00
Iron Ridge, No 1 (Sweed's)	43 00
Scotch	48 00@53 00

MANUFACTURED IRON.

Flat Bar	$0 3¾@0 4¼
Horse Shoe	5 5¼
Heavy Band	4¼ 5¼
Hoop and Light Band	5 10
Eagle Sheet Iron	6¾ 9¼
Boiler Sheet Iron	5¾ 6¾
Round and Square	3¾ 7¼
Oval	4¼ 5
American Spring Steel	11½ 13½
Plough Steel	11½ 13½
American Tool Steel (best)	.. 17½

LONDON, September 11, 1868.

In Staffordshire, says the *Mining Journal*, the state of the trade has not changed. The home demand is moderately good, and there is a tolerable flow of orders from the East Indies and other foreign markets; hnt few works have orders in hand for any length of time. There is, however, a growing feeling of confidence in the future, and several works, which have been closed for some time, are about to be started again. In Welsh the feeling of confidence already referred to is gradnally strengthening, and the accounts received from the iron districts generally are decidedly encouraging. The clearances for the Russian markets have increased, and it is probable that before the close of the season the exports to that country will prove larger than was expected. On American account, business continues without much change; buyers, upon the whole, evincing a little more freedom in their purchases. With South America and the East Indies there is hardly any trade doing. Continental inquiries are increasing in number, bnt the actual transactions entered into are of a limited character. The addition to the home demand is fully maintained, with every prospect of a further increase, and a substantial advance in quotations is looked forward to before long. In Swedish iron the demand still continues active, and a very good business has been done. In Scotch pig iron there has not been much activity, but prices, upon the whole, have remained tolerably firm, the last prices received from Glasgow being 53s 9d cash, and 54s ono month.

STEEL is in moderate demand only.

Iron.	Per ton.	
Bars, Welsh, in London	£6 10 0	£6 12 6
Bars, Welsh, to arrive	6 10 0	.. .. ..
Nail Rods	6 15 0	7 0 0
Nail rods, Staffordshire, in London	7 10 0	8 10 0
Bars, in London	7 10 0	9 10 0
Hoops, in London	8 2 6	9 15 0
Sheets, single	9 2 6	11 0 0
Pig, No 1, in Wales	3 15 0	4 5 0
Refined metal, in Wales	4 0 0	5 0 0
Bars, common, in Wales	6 0 0	.. .. ..
Bars, Merchant, Tyne, or Tees	6 10 0	.. .. ..
Bars, railway, in Wales	6 0 0	6 0 0
Bars, Swede, in London	9 17 6	10 0 0
To arrive	10 0 0	10 0 0
Pig, No 1, in Clyde	2 14 3	2 18 3
Pig, f o b in Tyne or Tees	2 9 6	.. .. ..
Pig, Nos 3, 4, f o b in Tyne or Tees	2 6 6	2 7 0
Railway Chairs	5 10 0	5 15 0
Railway Spikes	11 0 0	12 0 0
Indian Charcoal Pigs, in London	7 0 0	7 10 0
Steel.		
Swede, in kegs (rolled)	14 5 0	.. .. ..
Swede, in kegs (hammered)	15 0 0	15 10 0
Swede, in fagots	16 0 0	.. .. ..
English spring	17 0 0	23 0 0

THE COAL TRADE.

NEW YORK, October 2, 1868.

The prices of coal are still in the ascendant. The markets are reported firm. Prices will be no lower, and dealers must now get what coal they can from a somewhat bare market, and pay the prices that "to-day" rnle the trade. The sales of shipping have increased, and there is at present no prospect of a decrease in these sales. At the Scranton sale, at which 60,000 tons were sold, there was quite a large attendance of buyers, and bidding was very brisk. There was an average increase of nearly one dollar per ton over last month's sales, as will be seen by a comparisou of the sales of Wednesday, with that of August 26th:

	September 30.	August 26.
14,000 tons lump	$5 15 @5 25	$4 45 @4 47½
14,000 tons steamboat	5 37½@5 62½	4 80 @4 97½
10,000 tons grate	6 00 @6 15	5 00 @5 35
3,000 tons egg	6 52½@6 60	5 32½@5 40
10,000 tons stove	6 85 @6 90	5 42½@5 52½
8,000 tons chestnnt	5 52½@5 77½	4 30 @4 52½

From Baltimore we learn that Cumberland Coal is very scarce; prices are firmer, and the receipts insufficient to meet the demand. Anthracite is also scarce and firm. Philadelphia reports show active demand, at full prices. Shippers are only willing to sell at advanced prices, and there is less disposition to buy, except for immediate delivery. This lack of desire to sell has been occasioned by the immediate proximity of the Scranton sale, and partly on the supposition that the miners would, if higher prices ruled, demand an advance of wages soon after that sale.

In speaking of freights, the *Gazette* says: Freights continne stiff, but with a supply of vessels fully equal to the demand. The increased rate of freight to Boston will undoubtedly tend to materially advance prices at New York, both at public and private sale, as freights have not risen there in relative proportion to those at this point. There is a steady increase of tonnage over last year, and it is not improbable there will be nearly a million more tons produced, provided there is no further trouble at the mines, which amonnt will not more than meet the legitimate demand.

In speaking of some of the improvements calculated to benefit the coal regions, the *Mining Register* says: The Danville, Hazleton and Wilksbarre Railroad is being rapidly pushed forward toward completion. Many workingmen are employed on its whole length. Its connections will be with the Philadelphia and Erie, at Sunbnry, Penn., and the Lehigh Valley, at Hazleton. At the same time, it will develop the Lehigh coal field along the Black Creek, known as the Buck Mountain Coal Field, about 16 miles of which, lying on the western and northern side of the Lehigh Coal Basin, will be brought into markht.

In addition to the route from Schnylkill Haven to New York Bay, as noticed in our former report, we observe that proposals have been issued for building a road leading from the vicinity of Branchdale, on the south side of Mine Hill, via Tamaqua to Leighton.

The Reading Railroad Company have commenced work on the branch from Locustdale to the mines at the town of Heifenstein. The work is pushed forward nnder the vigorous action of Mr. Joseph Byers, Chief Engineer, and in charge of Mr. Wanacke, Assistant and Resident Engineer, and under contract to Mr. Thomas Reilly. The industry and promptness of these gentlemen will secure the completion of the road within a few months. It is six miles, and work not heavy. This branch will receive a large tonnage from two large collieries now erecting near the town of Heifenstein, to work the Lykens Valley Vein, 12 feet thick, and the Buck Mountain, 30 feet thick.

The road extended along the south side of Mahanoy Mountain to Trevertou, a distance of some 15 miles from Heifenstein, will receive a greatly increased tonnage from the different collieries that will be established all along its line.

A survey is now making of the Big Tunnel, from the south side at Heifenstein through Mahanoy Mountain, to reach the Mahanoy and Shamokin Coal Basin, by competent engineers, whose reports will show the lowest surface point at Locust Gap in Mahanoy and Shamokin Coal Field, north of Mahanoy Mountain, is some 700 feet higher than the lowest part of the valley on the south side of the mountain at Heifenstein. This tunnel will reach the Lykens Valley Vein in 500 yards, two thirds of the distance through red shale.

Arrangements are being made by the Philadelphia Transportation and Freight Company, incorporated by the Legislature of Pennsylvania, to introdnce boats propelled by steam, on the Schnylkill Canal, for the cheap and speedy transportation of coal' merchandise and miscellaneous freights, between this Region and Philadelphia. The navigation of the old fashioned umbering boats costs about 23 cents per mile, while steam can be employed at an expense of 9 cents, with a speed of six miles an hour over them, with less liability to stoppage.

The following will show the amount of Coal exported from the port of New York for the week ending Sept. 29, and for the season to that date, compared with the amount shipped last year:

Exports for the week	tons. 543
Exports from Jan. 1	tons. 47,827
Exports same time last year	tons, 51,743

BOSTON, September 30, 1868.

In English Cannel there have been sales at $17@$19 per ton for large and small lots. In Sydney and Pictou large sales at $8 50 per ton, and Cumberland at $8 per ton. Penn and Westmoreland Gas has been selling at $10 50@$10 75 per ton; Authracite has been in good retail demand at $9@$10 per ton; in cargoes, are nominally $8 50@$8 75 per ton.

PHILADELPHIA, September 29, 1868.

There is rather more doing, and prices are well maintained.

The following table exhibits the amount of Coal that was passed over the various routes of transportation from the Pennsylvania Coal districts for the week ending Sept. 26, 1868, and for the season to that date. A comparison is also made with the amounts transported the corresponding week in 1867, showing the increase or decrease, as the case may be:

COMPANIES.	1867. WEEK.	1867. TOTAL.	1868. WEEK.	1868. TOTAL.	INC. OR DEC. WEEK.	INC. OR DEC. YEAR.
Phil. & Read. R. R.	81,813	2,422,618	96,951	2,284,763	15,138 d	237,855
Schuylkill Canal...	25,498	707,490	32,895	638,223	7,397 d	69,269
Lehigh Valley R. R	41,914	1,585,401	58,059	1,743,918	11,244	197,372
Lehigh & Sns. R. R	10,378	385,365	30,730	654,698	20,352	269,323
Lehigh Canal.....	34,740	706,241	37,931	655,766	3,191 d	50,475
Scrantou North...	14,195	336,821	19,164	422,251	3,971	85,430
Scranton South...	22,302	947,970	21,049	804,466 d	1.253 d	143,504
Penn. Coal Co. ar'sl	18,107	607,735	19,792	675,519	1,686	67,884
Penn. Coal Co. ear'sl	714	16,791	717	21,777	3	4,976
Del. & Hud'n Canal	40,672	998,842	47,375	1,159,309	6,703	160,487
Shamokin.....	8,996	351,940	14,727	365,446	5,703	13,506
Trevorton	1,016	31,856	1,158	20,991	143 d	10,865
Short Mountain...	2,823	54,436	4,154	84,566	1,331	30,130
Lykens Valley Co.	2,139	49,150	2,117	64,869 d	20	15,720
Hunt'g'n & B'd T'p	5,715	195,429	7,650	186,940	1,935	8,689
Wyoming South..	14,058	245,494	11,856	220,838 d	2,202 d	24,656
Wyoming North..	.....	35,196	4,498	50,677	....	37,544
Williamstown Col.	.....	97,291	3,274	123,389	....	26,098
Total.....	325,080	9,725,963	413,099	10,878,216		
			325,080	9,725,963		
Increase.....			88,019	1,152,253		

Schuylkill Coal Trade.

BY RAILROAD AND CANAL, FOR WEEK ENDING, OCT. 2, 1868.

	RAILROAD.	CANAL.
St. Clair	44,087	....
Port Carbon	10,194	10,643
Pottsville	3,759	1,014
Schuylkill Haven	33,067	22,628
Auburn	4,653	....
Port Clinton	7,039	11,065
Compauy's use	2,610	....
Total for week	105,429	49,350
Previously this year	1,184,763	628,223
Total	2,289,182	679,573
Same time last year	2,505,988	584,470
Increase	212,759	56,897

Lehigh and Susquehanna Railroad.

Report of Coal shipped for week ending Sept. 26, 1868.

WHERE FROM	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
WYOMING REGION.		
Newport Coal Co.	....	....
Albrig'ton, Roberts & Co	123 06	7,848 17
New England Coal Co	....	206 11
Valley Coal Co	....	....
Warrior Run Mining Co	....	....
Parrish & Thomas	846 04	10,288 14
New Jersey Coal Co	315 05	10,999 09
Gaylord Mines	....	224 11
Delaware & Hudson Canal Co	10 15	7,469 14
Lehigh & Susquehanna Coal Co	....	15 10
Germania Coal Co	506 11	15,297 11
Franklin Coal Co	....	243 18
Audenreid Improvement Coal Co	....	....
Wilkesbarre Coal & Iron Co	11,816 12	203,698 05
Union Coal Co	....	2,040 07
Mineral Spring Coal Co	....	6,655 17
H. H. Hillman & Son	....	1,346 09
Bowkley, Price & Co	97 10	1,023 13
Wyoming Coal & Transportation Co	....	3,312 04
Henry Colliery	....	5,103 08
J. H. Swoyer	....	3,268 02
Everhart Coal Co	....	....
Morris & Essex Mutual Coal Co	....	78 19
Shawnee	669 06	14,414 01
Pine Ridge Colliery	78 00	5,574 07
Lances Colliery	26 12	1,521 17
Consumers Coal Co	127 00	3,431 03
Harvey Brothers	....	184 11
Other Shippers	186 09	7,117 08
Total Wyoming Region	14,803 10	311,365 06
UPPER LEHIGH REGION.		
Upper Lehigh	3,781 13	87,599 01
Other Shippers	189 12	8,396 11
Total Upper Lehigh Regiou	3,971 05	95,995 12
HAZLETON REGION.		
A. Pardee & Co	1,598 01	51,676 01
Linderman & Skeer	95 02	1,236 08
Sharpe, Weiss & Co	901 08	31,446 04
Wm. S. Halsey & Co	120 13	1,869 14
Harleigh Coal Co	618 18	22,291 04
G. B. Markle & Co	1,356 09	35,555 15
Ebervale Coal Co	1,025 16	21,974 13
Stont Coal Co	799 18	10,620 06
Buck Mountain Coal Co	1,439 18	18,066 10
Coxe Brothers & Co	761 08	8,472 19
Ashburton Coal Co	....	64 06
Highland Coal Co	548 15	12,694 03
Pardee Brothers & Co	347 10	6,222 03
Jeddo Coal Co	278 03	7,052 03
Mount Hall (J. S. S.)	....	....
Other Shippers	....	927 02
Total Hazleton Region	9,918 19	230,239 11
MAUCH CHUNK REGION.		
Lehigh Coal & Navigation Co	....	....
Summit Mines	27 15	27 15
Room Run Mines	2,009 00	17,053 15
Other Shippers	....	17 00
Total Mauch Chunk	2,036 15	17,098 10
" Mauch Chunk Region	2,036 15	17,098 10
" Hazleton	9,918 19	230,239 11
" Upper Lehigh	3,971 05	95,995 12
" Wyoming	14,803 10	311,365 06
Grand Total	20,730 09	654,698 19
Corresponding week last year	10,878 05	385,365 11
Increase	20,352 04	269,333 08
Decrease	....	....
Forwarded South from Mauch Chunk by Rail	13,852 18	281,123 07
Delivered on line of L. & S. R. R. ab've M'ch C'k.	349 09	52,376 04
Delivered at Coal Port for shipment by canal	16,528 02	321,199 08
Total	30,730 09	654,698 19

Lehigh Canal Coal Trade.

Shipped for the week ending Sept. 26, 1868.

WHERE FROM.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Mauch Chunck Region	13,953 03	258,525 07
Beaver Meadow "	6,688 12	68,056 07
Mahanoy "	288 08	2,097 15
Hazleton "	8,616 17	189,494 13
Upper Lehigh "	1,164 07	13,255 06
Wyoming "	7,224 12	124,336 11
Total	37,930 19	655,765 19
Corresponding week last year	34,740 03	706,240 16
Increase	3,190 16	....
Decrease	....	50,474 17

Report of Coal Transported over Lehigh Valley Railroad.

For the week ending September 26, 1868, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVIOUSLY Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mahanoy	13,064 04	328,691 13	341,755 17
Total Hazletou	20,822 17	797,771 03	818,594 00
Total U. Lehigh	476 16	84,074 19	84,551 15
Total B. Meadow	10,787 17	318,222 07	329,010 04
Total Wyoming	7,906 18	212,099 15	220,006 13
Grand total	53,058 12	1,690,859 17	1,743,918 09
Same time last year	41,913 16	1,194,187 07	1,535,401 03
Increase	11,144 16	197,372 10	208,517 06
Decrease	....	....	....
Forwarded east from M. Chunk by r'l	53,058 12	1,690,859 17	1,743,918 09
Delivered at M. C'k and on line of r'd above that point	7,742 09	31,900 12	39,643 01
At Penn Haven for shipm't by canal	8,282 08	111,854 07	120,136 15
At M. Chunk for shipment by canal	5,460 11	64,205 13	69,666 04
Total by rail and canal	74,544 00	1,898,820 09	1,973,364 09
Same time last year	46,832 17	1,572,180 07	1,618,972 04
Increase	27,711 03	326,681 02	354,392 05
Decrease	....	....	....

The item, 7,732.99 coal delivered on line of road above Mauch Chunk, includes 5,788.14 for use of L. V. R. R. Co. for the year up to Aug. 31, 1868, on Wyoming Division.

Cumberland Coal Trade.

By B. & O. RAILROAD.—The shipments over the Baltimore and Ohio Railroad, for the week ending Sept. 26, were as follows:

From Cumberland and Pa. Railroad, via Cumberland	
Consolidation Company	1,704 08
Borden	1,041 07
Midland	227 19
Allegany	71 04
From George's Creek, via Piedmont.	
George's C. & I Company	2,331 18
Central	3,414 11
Atlantic	393 18
Savage Mt.	160 18
Franklin	264 18
Piedmont	594 17
Swanton	248 15
Potomac	1,448 15
Hampshire	2,744 12
American	407 14
Barton	271 02
Total	15,899 01
From Eckhart RR.R.	
C. & I. Co.	1,369 08
Total	17,268 09

By C. & O. CANAL.—There were despatched from this port, during last week, 10,252.08 tons of Coal, forwarded by the following companies:

American	1,823 19
Borden	764 19
Central	2,257 11
Consolidation	2,423 00
C. & I. Co.	2,527 07
H. & B.	540 13
National	114 14
Total	10,252 08

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

At New York, Oct. 2, 1868.

Schuylkill E. A., choice..	$5 75	$....	Schuylkill Chestnut...	$4 50	....
" Ordinary.....	5 50	....	Lehigh W.A.L'p old Co..	5 62	....
" W. A. Lump .	5 50	....	" Broken.....	5 57	....
" Steamboat....	5 00	....	" Egg	5 37	....
" Broken.....	5 50	....	" Stove.....	5 62	....
" Egg	5 60	....	" Chestnut.....	4 87	....
" Stove	5 75	....	Shamokin.....	5 50	....
SPECIAL COALS.—DEALERS' QUOTATIONS.					
Diam'd Vein R.A.,Sch'kill	7 00	....	Old Co.'s W. A. Lehigh..	5 88	6 50
Locust Vale W. A., "	6 50	....	Mt. Pleasant.....	....	....
Honey Brook " Lehigh	6 25	6 50	Buck Mountain.....	5 88	6 88
Harleigh " "	6 50	....	Buck Ridge W. A.,Sh'kin.	6 75	....
Spring M'n " "	5 25	6 25	H. Hefis, E. F'klin, Lorh.	5 75	....
Sugar Creek " "	6 25	6 50	New England Red Ash..	6 25	....
Ashburton " "	....	....	Wyoming.....	6 00	6 25

Dealers in these Coals may be found in our advertising columns.

At Philadelphia, Oct. 2, 1868.

Lehigh L'p and St'mb't..	5 50	....	Henry Clay, Egg & St...	....	4 50
" Broken and Egg..	5 50	....	Locust Mount Lump....	4 25	4 50
" Stove.....	6 00	....	" Steamboat.	4 50	4 75
" Chestnut.....	4 75	....	" Broken ...	4 50	4 75
Schuylkill R. A.....	5 25	5 60	" Egg.....	4 50	4 75
" Chestnut.....	4 00	4 25	" Stove	5 00	5 25
" W. A. Lump..	4 25	4 50	Lorberry Coal.....	5 00	....
" Broken	4 50	4 75	Shamokin.....	....	....
" Egg and Stove.	4 50	4 75	Franklin, (Lykens Val.).	5 50	....
" Chestnut...	4 00	4 25	Broad Top	5 00	....
Hill & Harris, Egg & St.		4 80			

Scranton Coal at Elizabethport, Oct. 2, 1868.

(Corrected weekly by D. L. & W. R. R. Co.

Lump.....	4 75	....	Egg.....	5 75	....
Steamer.....	5 25	....	Stove.....	5 75	....
Grate.....	5 50	....	Chestnut.....	4 75	....

Prices for Pittston Coal at Newburgh, Oct. 2, 1868.

(Corrected weekly by Penna. Coal Co.)

Lump, per ton, 2240 lbs..	5 10	....	Egg " "	5 10	....
Steamer, " "	5 00	....	Stove " "	5 35	....
Grate " "	5 10	....	Chestnut " "	4 55	....
Pea " "	3 25	....			

70 cents additional to New York.

Lackawanna at Rondout, Oct. 2, 1868.

Lump.....	4 75	....	Egg.....	5 25	....
Steamer.....	5 10	....	Stove.....	5 50	....
Grate.....	5 20	....	Chestnut.....	4 50	....

65 cents additional to New York.

Lehigh Coal at Elizabethport, Oct. 2, 1868.

Lump.....	6 25	....	Chestnut.....	5 60	....
Steamboat and Broken..	5 75	....	Stove.....	6 25	....
Egg.....	5 75	....			

Wilkesbarre Coal at Hoboken, Oct. 2, 1868.

(Corrected by Wilkesbarre Coal & Iron Co.)

Lump.....	5 50	....	Egg.....	5 75	....
Steamer.....	5 75	....	Stove.....	6 00	....
Broken.....	5 75	....	Chestnut.....	5 25	....

At Baltimore, Oct. 2, 1868.

Wholesale prices to trade.

Wilkesbarre by cargo or car load	$6 10	@6 25	Trevorton R. A..... $5 50 @5 75
Pittston and Plymouth..	5 75	6 00	By retail, per ton of 2,240 lbs., delivered..... 7 00 7 50
Shamokin R., or W. Ash	5 50	5 90	Georges C'k & Cumberland f. o. b. at Locust
Lykens Valley, R. A.....	5 65	5 85	Point for shipping..... .... 4 75

At Havre de Grace, Md.

Cargo prices for shipment *south* of Patapsco River, (drawback allowed of 21c.)			Shamokin R. or W. Ash.	$6 00	@....
			Lykens Valley R. A.....	5 65	....
			Trevorton R. A.....	5 40	5 60
Wilkesbarre and Pittston W. Ash.....	$6 00	@....			

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

George's Creek and Cumberland f. o. b..... $.... @4 55

An advance of twenty cents per ton has recently been allowed boatmen on canal freights from Cumberland, and the price of coal correspondingly advanced.

Prices of Gas Coals.

October 2, 1868.

PROVINCIAL.	Coarse. Gold.	Slack. Gold.	AMERICAN.	Coarse. Currency.	Slack. Currency.
Duty, $1 25					
Block House.....	$1 75	@$ 75	Westmoreland Co....	$8 50	$8 00
Gowrie.....	1 75	75	Despard Coal Co.....	8 25	8 00
Lingan.....	1 75	75	Penn.....	8 50	8 00
Sydney.....	2 13½	71½	Newburgh Orrel Gas..	8 50	8 00
Pictou.....	2 13½	1 18½	Delivered in New York.		
Little Glace Bay.....	1 75	1 00			
Caledonia.....	1 60	75			

Prices of Foreign Coals.

Duty, $1 25 per ton.

Corrected weekly by PARMELEE BROS., 32 Pine Street, N. Y.

Liverpool Gas Caking.....	$ 9 50	Liverpool House Cannel	18 00 19 00
" " Canuel.....	14 00	" " Orrel.	16 00 18 00

Per ton 2240 lbs. Ex. ship.

PRICES FROM YARD.

Liverp'l House Orrel, scr'd..	$18@20	Liverp'l House Can'l, scr'd.	$22 00 ....

Per ton 2000 lb., delivered.

Coal Freights.

(Corrected Weekly).

Rates of Freight from Newburgh.

RIVER.

On "Pittston" Coal, by boats and barges of the Pennsylvania Coal Co., per ton of 2,240 lbs.

Troy and West Troy.....	$ 55
Albany and Greenbush.....	50
Coeymans.....	45
Coxsackie and Stuyvesant.....	40
Hudson and Catskill.....	35
Saugerties and Barrytown.....	35
Rhinebeck and Rondout.....	30
Po'keepsie and New Paltz Land.	25
Fishkill Landing.....	20
Cold Spring and West Point....	30
Peekskill.....	40
Haverstraw.....	45
Sing Sing and Nyack.....	50
Tarrytown and Piermont.....	50
Yonkers.....	55

The coal must be discharged with all reasonable dispatch, at the expense of the consignee, who shall also pay wharfage on the boat. Boatmen will tend guy while unloading.

EASTERN.

Stamford	$1 25
Norwalk.....	1 25
Bridgeport.....	1 25
New Haven.....	1 25
New London.....	1 40
Norwich.....	1 50
Mystic.....	1 45
Stonington.....	1 45
Sag Harbor.....	1 45
Bristol.....	1 55
Newport.....	1 55
Fall River.....	1 55
Providence.....	1 60
Dighton.....	1 60
Warren.....	1 60
Pawtucket.....	1 75
New Bedford.....	1 90
Boston.....	2 15
East Cambridge.....	2 25
Salem.....	2 15
Newburyport	2 25
Portsmouth	2 25
Portland.....	2 00

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

Sept. 23, 1868.—From Philadelphia and Reading R. R. Wharves, Phila., to

Boston	$2 50	@3 25	New York.....	$1 25	@1 40
Providence.....	2 00	2 30	Fair Haven.....	— —	2 75
Lynn	3 25	3 50	Haverhill.....	— —	4 35
Portland.....	3 20	3 25	Hingham.....	— —	3 30
Chelsea	— —	3 30	Hyaunis	— —	3 25
Fall River.....	— —	2 75	Marblehead	— —	3 3a
New Bedford.....	2 50	2 75	Maldeu.....	— —	3 00
Salem.....	3 10	3 35	Nantucket	— —	3 25
Newport.....	— —	2 50	Nahant	— —	3 50
East Cambridge.....	— —	3 30	Plymouth.....	— —	3 35
Newberryport.....	— —	3 50	Provincetown.....	— —	3 50
Portsmouth.....	3 25	3 50	Truro.....	— —	3 50
Ameshury.....	— —	3 65	Weymouth.....	— —	3 30
Troy.....	— —	1 40	East Greeuwich.....	— —	2 00
Charleston.....	— —	2 00	Southport.....	— —	3 50
Bath.....	— —	3 00	Albany.....	— —	1 35
Danversport	— —	3 30	Hoboken.....	— —	1 30
Bangor	— —	2 75	Trenton.....	— —	40
Ameshury Point.....	— —	3 75	Washington.....	1 40	1 50
Beverly.....	— —	3 25	Richmond.....	— —	2 00
Charlestown.....	— —	3 25			

From Elizabethport and Port Johnson.

Albany.....	$ 85	@— —	New London	$1 15	— —
Boston.....	2 00	— —	Newport.....	1 40	— —
Bridgeport.....	1 00	— —	New York.....	60	— —
Fall River.....	1 45	— —	Norwalk.....	1 00	— —
Hartford.....	1 50	— —	Norwich.....	1 35	— —
Hudson.....	1 00	— —	Pawtucket and towing..	1 60	— —
Wareham.....	1 35	— —	Portland.....	1 90	— —
Middletown.....	1 25	— —	Portsmouth.....	2 10	— —
New Bedford.....	1 50	— —	Providence.....	1 40	— —
Newburyport.....	2 15	— —	Salem.....	1 75	— —
New Haven.....	1 00	— —	Augusta	2 25	— —

Rates of Transportation to Tide Water.

[BY RAILROAD.]

To Port Richmond, Philadelphia.

Philadelphia and Reading Railroad, from Schuylkill Haven..... $2 00

The following are the drawbacks allowed on all coal shipped East of New Brunswick and South of Cape Henry, until further notice.

	Drawback.	Freight.	Nett.
Lump.....	85	$2 00	$1 15
Steamboat.....	85	2 00	1 15
Broken.....	50	2 00	1 50
Egg.....	50	2 00	1 50
Stove.....	25	2 00	1 75
Chestnut.....	40	2 00	1 60

From Port Carbon, 3 cents per ton more.

To Elizabeth.

L. V. Railroad from Mauch Chunk to Easton.....	$ 81
C. R. R., N. J., Easton to Elizabethport.....	1 22
	2 03
Shipping Expenses at Elizabethport.....	25
Total.....	2 28

To Port Johnson.

L. V. R R.....	$ 81
C. R. R. of N. J.....	1 20
Shipping Expenses.....	25
Total.....	2 35

To Hoboken.

L. V. R.R.....	81
Morris & Essex R.R.....	1 29
Shipping Expenses.....	25
Total.....	$2 35

[BY CANAL.]

To Port Richmond.

From Schuylkill Haven to Port Richmond.....	$1 00
Freights and tolls by Raritan Canal.....	1 90
	2 90
Drawback.....	30
Total	2 60

To New York.

From Mauch Chunk to New Brunswick, by Lehigh, Del. Div. and Del. & Raritan Canal.....	$ 90
Freights through.....	1 25
Towage	20
	2 35

To New York via Morris Canal.

Lehig Canal.....	$ 84
Morris "	40
Towage	10
Freight.....	1 55
Total.....	2 89

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

Lehigh tolls (net).....	$ 84
Morris "	54
Freight	1 50
Re-shipping.....	30
Total.....	2 48

Provincial Freights.

TO NEW YORK.		TO BOSTON.	
Sydney.....	$3 50	Sydney.....	$2 75
Lingan.....	....	Lingau.....	2 25
Cow Bay.....	4 50	Cow Bay.....	....
Port Caldonia	4 25	Port Caldonia.....	3 00
Little Glace Bay.....	4 00	Little Glace Bay.....	2 75

Foreign Freights.

New Castle and Ports on Tyne.....	£18@£15 keel.				
Liverpool.....	12s. 6d.@15s. ton.				
Australian.....	9 50	@10 00	Lehigh.....	13 50	@14 00
do. Wallsend.....	10 00	10 50	Liverpool.....	18 00	....
Bellingham Bay.....	11 00	....	Pittston, ton.....	14 50	15 00
California.....	7 00	9 00	Scranton.....	14 00	15 00
Cumberland cks.....	30 00	32 00	Scotch.....	13 00	....
do bulk.....	28 00	....	Vancouver Island.....	12 50	....
Chili.....	10 00	....			

SAN FRANCISCO STOCK MARKET.

A telegram from San Francisco, dated Sept: 30, quotes:

STOCKS.	Per Sh.		SHARES.	Per Sh.	
Gould & Curry.....	100@	104	Belcher.....	135@	....
Savage.....	103	....	Imperial.....	105	108
Cholar Potosi.....	156	157	Alpha	46	47
Hale & Norcross.....	49	50	Amador	240	....
Crown Point.....	46	47	Kentuck.....	287	....
Yellow Jacket.....	1,392	1,395			

AMERICAN

Journal of Mining.

WESTERN & COMPANY, Proprietors.

ROSSITER W. RAYMOND, Editor.

OFFICE, 37 PARK ROW, NEW YORK.

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DESIGNING, LITHOGRAPHING WOOD ENGRAVING, and JOB PRINTING Executed in elegant style, on reasonable terms.

W. B. Harrison is Editor of the Mechanical Department.

T. P. Pemberton is Corresponding and Traveling Editor.

☞ Correspondents, exchanges and others addressing us should be *extremely careful* to write "Journal of Mining," instead of "Mining Journal," and to give the number of our Box at the Post Office, which is 5963, to ensure safe carriage. Communications intended for publication should be plainly written, and on one side of the paper only.

NEW YORK, SATURDAY, OCTOBER 3, 1868.

CONTENTS OF THIS NUMBER.

MORE SUBSCRIBERS WANTED—LIBERAL INDUCEMENTS.

We make the following very liberal offers to any who may feel disposed to aid us in increasing the circulation of the Journal of Mining. To any one who will send us the names and addresses of *five* new subscribers for the period of one year, and $20 in currency in payment therefor, we will give in return for such effort one copy of Kustel's new work on "Concentration and Chlorination," Price, $7.50. That is an offer that should most assuredly command the attention of all who are in need of the work.

Again, any one sending us the names and addresses of *four* new subscribers and $16.00 in payment therefor, will be rewarded with the neatly bound Vol. No. V. of the Journal of Mining. Price, $5,00. For *three* subscribers we will present a copy of Hollister's "Mines of Colorado." Price, $2.00. Or again, for *two* subscribers, one copy of William Hopton's "Conversation on Mines."

Should none of the above works be desired, we will furnish any that may be called for under the above terms.

THE SMELTING OF COPPER ORES IN CANADA.

Some facts from trustworthy sources have lately come to our knowledge in regard to the present manufacture of copper from a pyritous ore in the Province of Quebec, about eighty miles distant from the city of that name, upon the Grand Trunk Railway. They are of a very cheering character, and coming to us as they do, at a time when the copper interest generally, is in a very depressed condition, we feel inclined to make them the basis of a few editorial lines. They may serve to encourage those who are engaged in similar undertakings, but unfortunately not with the same success. At all events we have good testimony to the effect tha even at the present unprecedently low rates of ingot copper in the market it is possible to utilize low grade ores, and that too at a fair rate of profit. The facts as given to us by one of the gentlemen who assisted in inaugurating the enterprise run about as follows:

Through the talcose and chloritic slates of the region of the country alluded to, cuts a vein of copper ore, having an average width of about ten feet. The vein yields a low grade pyritous ore, assaying only about four per cent. of copper. The conditions of the vein are, however, such that it can be easily worked, the expense of mining the ore amounting to some $2 15 per ton in gold. The ores are broken, sorted, and roasted in heaps in the open air, at a cost in gold of seventy-five cents per ton. This work is done by contract; the contractor preparing the fuel necessary, a great abundance of timber being near at hand upon the lands of the company. Thus much for the mining and preparation of the ore for the following process of smelting. This is done upon the works erected near at hand, consisting of four furnaces supplied with a cold air blast, a steam engine furnishing the necessary power. We understand that the furnaces were modeled after those in use upon the works of the Revere Copper Company at Point Shirley, near Boston, but have since undergone some slight modifications, in order to adapt them more perfectly to the nature of the ore, and to bring out the very best practical results. The fuel used for smelting the ore is of the very best. It is imported from New Castle on the Tyne, and costs delivered at the works thirteen dollars in gold per ton. The gangue mass in the vein is of such a nature as to render the use of a flux unnecessary. We have now to speak of some of the results of the practical working of these furnaces. We confess to no little surprise when our attention was called to them, and are of the opinion that copper men generally are quite as little prepared for them as we were, for, in point of successful copper smelting they really seem to go beyond all precedent. Two furnaces running at the same time, produce nearly five tons of matt per day. Each furnace has a capacity of about twenty-three tons of ore in one day of twenty-four hours. They run, of course, day and night. The consumption of fuel is remarkably light, and the amount of concentration proportionally great. We are informed that every ten tons of ore produces one ton of matt, containing nearly forty per cent. of copper. This is as it should be, when we remember that it is a four per cent. ore that is taken from the mine. As we have it in our notes, the average percentage of the matt produced in the last six months amounts to thirty-seven and nine-tenths per cent. The cost per ton of ore all told, for smelting, amounts to the sum of four and a quarter dollars in gold. This copper matt is subjected to no further treatment upon the works, but shipped to Liverpool and there sold in the market at the ruling rates. The cost of shipment, including freight, insurance, commission, etc., amounts to twelve dollars in gold. At the present market rates of copper, the matt sells in the Liverpool market for some $130 in gold per ton. In connection with this manufacture of copper matt, there is one point of peculiar interest that we must not fail to mention, as to it the success of these works is in a great measure due. In the smelting of pyritous copper ores it is generally necessary to blow out at the expiration of a few days, or at the most, in a couple of weeks, and rebuild the interior portions of the furnaces, they having become meanwhile so eaten away and changed in form as to render it impossible to bring about the desired metallurgical results without such reconstruction. But, in this instance, by some slight modifications of the furnaces, together with a certain peculiar management, it has been possible to largely overcome this difficulty. It seems that when the fire brick lining of the furnaces is eaten away, a certain peculiar course of procedure on the part of the smelter causes a new lining to form in place, composed of the slag from the smelted ores. It is certainly a very anomalous course of procedure, but as long as it brings about the required results at the lowest rate of cost, nothing could be better. At the time of our interview with our informant, one furnace had entered upon its tenth week of work, and appeared good for two or three weeks more before it would be necessary to refit. It is evident that for the smelting of this kind of ore, under the above conditions, there has been a great improvement made—an improvement that may, perhaps, be made to serve the interest of others engaged in a similar work. If the price of copper in the market is going to remain at its present low figure, there must be a proportional decrease in the cost of its production, if not, our copper mines will have to remain unworked and our smelting works stand still. We are only too glad, amid the general stagnation that now prevails among the copper industries of the country, to be able to record what we have of an enterprise that has sprung up in our midst during the past year, and by means of a proper application of enterprise and skill been brought to such a good degree of success. We hope to obtain in the future, still further information in regard to the enterprise, that will be of general interest to our readers.

OBSERVATIONS ON VEIN FORMATION.

The question of the filling out of fissures in the solid crust of the earth with mineral masses, giving rise thereby to the vein formations that are found, for the most part, in the more rugged mountainous portions of the globe, has been for many centuries a subject for hypothesis, investigation, and discussion among scientific men. From the days of Diadorus Siculus and Pliny, down to the present moment, there have sprung up men who have endeavored to solve this perplexing problem. There have been, of course, nearly or quite as many theories or hypotheses in regard to the matter as investigators. Some of them, naturally enough, in the light of the scientific facts of the present day cut a very ridiculous figure. Others contain some grains of truth, while again not a few thinkers more far-seeing than the mass seem to have penetrated more nearly into the heart of the matter. Agricola, for instance, one of the earliest systematic writers upon such subjects, in a work published in 1546, spun out a theory in which water, heat, and cold played the principal parts. In accordance with the then existing condition of natural science, he supposed that the metals were produced from other substances; long ago, however, an exploded idea. Another view entertained by Becher, who wrote in 1703, was to the effect that ores and metals forced their way from the innermost parts of the earth, into the fissures in the form of vapors—a view that at the present day is defensible in part, at least, as regards certain particular cases, as for instance, the filling out of fissures in volcanoes with sublimed ores, especially with iron glance precipitated from the vapors of iron chlorid. In the same way, of course, in earlier periods of the earth's history similar iron ore vein deposits many have been formed, as well also as many other kinds of ore-veins. As has been very wisely remarked, we must always know the peculiar conditions of each individual case, in order to be able to judge with any kind of certainty as regards the origin of veins. Another writer, Stahl, who in the year 1700 gave to the public a work on metalliferous veins, held that they came into existence at the same time as the country rock, and that, at the time of the creation of the world. There is no use of commen. upon the absurdity of such a theory. Hofmann, again in the year 1738 advanced the idea that veins were formed by the filling out of fissures, a view, from the stand-point of the present day, perfectly correct in so far as it goes. But we have, perhaps, given enough of these different views; enough most certainly to convince our readers that the field is one in which speculative minds have had full play We will hereafter refer again to this very interesting topic of consideration.

COLORADO IRON.

With the gradual development of the gold, silver and copper industry of Colorado, the vast amount of wealth to be derived from her mines of iron ores is not overlooked. This enterprising Territory has fallen into line as regards the home production of iron, a furnace at Denver being fairly under way with a fine prospect ahead. There can be no doubt but that a favorable opportunity is open to those that engage in iron manufacture in the States and Territories of the West, or, in fact, in the utilization of any of the economic minerals so abundant in that region of country. Speaking somewhat figuratively, there is often more gold to be won from the working of a mine of useful ores than from a mine yielding the virgin gold itself. The rapid development of the Western mining regions must create for such production in the home market, a demand that will not fail to use up the supply, and that too, it would seem, at remunerative rates of compensation to the producer. Next to Colorado, we may, perhaps, learn that Utah has come in for her share in the home manufacture of such products. She has the raw material at hand. Nothing is wanting but a judicious application of skill and capital in order to develop her wealth of useful mineral deposits. The Pacific Railway will want her branch roads running up and down the valleys of the various mountain chains. The iron for their superstruction, at least, ought to come from the ore beds that lie close at hand.

TIMBER SUPPORTS IN MINES.

In visiting a silver mine some years ago in one of the prominent European districts, it was our good fortune to be shown around the works by an old manager or overseer, who had grown grey in the service, having had at the time of our conversation with him forty-five years experience in underground workings. We remember well his half-perplexed, half-astonished look, when we, perhaps, somewhat facetiously asked how he determined the pressure upon the various parts of the shafts, galleries, etc., in order thereby to determine the size of the timbers necessary to withstand it. His reply came quickly and to the point. Said he: "You can only *judge* of the pressure. It can never be measured. But," he continued, "there is one unfailing rule that should never be deviated from. *Be sure that you get your timber strong enough.* If your supports happen to be *too large*, as a rule, no one will ever be able to prove such to be the case. If, on the contrary, they are *too small*, they will very soon be their own witness to the fact." As we read every now and then of the crushing in of timber supports in our mines, and their consequent disasters, the substance of the conversation is brought most forcibly to mind. It would be well for our mining engineers never to be over-confident, but to bear constantly in mind the old man's maxim: "Be sure that you get your timbers strong enough."

Ore Concentration Without Water.

We are glad to announce that something not only *new*, but also, in our estimation, *very valuable* in its application to the concentration of ores of gold, silver, copper, lead, iron, etc., is on the point of being brought before the mining public through the columns of the Journal of Mining. It is a machine that, by means of a proper use of air, will separate the worthless matter with ease, precision, and rapidity. So nicely does it work, that one feels impressed in a moment upon witnessing it, that here is something

possessing real merit. Its movement is so perfect that it will separate into distinct layers the sulphides and chlorides of the Rocky Mountain ores. We have ourselves seen it separate the gold from Georgia sands with an almost automatic action. We see no reason why it may not be employed to take out the gold from the alluvium in placer diggings where there is no opportunity of bringing in water. We believe this new ore concentrator has before it a splendid career.

The Longest Subscription Yet.

When we first commenced the publication of the JOURNAL OF MINING the paper was so well received that it was not uncommon for us to receive subscriptions for two or three years in advance. We thought that was good, but now that our paper has arrived at a tolerably advanced age, we are beginning to receive them for a length of time that may, perhaps, somewhat astonish our contemporaries of the press. One of the appreciative mining men of Nevada sends us a draft for fifty dollars in gold, which, converted into currency, will pay the subscription price of the JOURNAL OF MINING for a period of eighteen years! As many of our friends as choose can follow this worthy example. Who will be the one to beat it?

A Ship Canal.

It is reported by a distinguished Engineer of the U. S. Army, GEN. G. K. WARREN, that the construction of sixty miles of ship canal and river improvements would open into Lake Superior ten thousand miles of steamboat navigation. It would give another outlet to the constantly increasing amount of mineral and metallurgical products of the Lake Districts, by way of the Mississippi. Such an enterprise, undertaken and completed, would be of almost incalculable value as regards the future prosperity of the States of the North West. When will it be done?

Great Improvement.

The JOURNAL OF MINING appears this week in a new dress. We trust our readers will appreciate the great improvement made for their benefit at considerable cost to the publishers. Will they not reciprocate the favor by introducing the JOURNAL OF MINING to the notice of their friends, and soliciting their subscription patronage for it? Read the liberal inducements for subscribers offered elsewhere in the present issue.

—In our brief editorial remarks last week upon "The Highest Mine," in our use of the words "Andes" and "Europe" we very clearly implied it was our belief that the former are situated within the territorial limits of the latter. The mistake was brought about by one of those mental aberrations to which all human beings are often momentarily subject. The Alps and Andes had for the instant changed places. But when the mental illusion had passed away, the inexorable types had done their work. Of course our geography was not at fault. Mitchell's old Atlas has too many fingerprints for that.

ANSWERS TO CORRESPONDENTS.

J. C., OF NEWBERN, N. C.—To prepare jewelers' gold, you must melt in a good crucible, with a little borax, three parts of pure gold, and add thereto one part of copper. Gold, for coin, consists of eleven parts of pure gold, and one part of copper. Gold and silver are too soft to be used for coinage or other purposes in a pure state, but the addition of copper renders them sufficiently hard to withstand the wear and tear of circulation.

A. M. M., OF OMAHA.—One of the most delicate tests for mercury is to put a drop of hydrochloric acid on a gold coin, and add a little of any oxide or saline compound of mercury, together with a little tin. The gold will be amalgamated by the mercury, and exhibit a white spot.

QUERIST, LOUISVILLE.—The quantity of coal known to exist in the United States and the British Possessions is so large that, for all practical purposes, it may be regarded as inexhaustible.

R. S., OF JERSEY CITY.—The tension of steam increases in a much greater ratio than its temperature. For instance, at 212 deg., Fahr., it exactly counterbalances the mean atmospheric pressure of 29 inches, equal to the barometric mercurial column; at 240 deg. it is doubled, at 275 deg. trebled, and at 300 deg. four times that of the atmospheric pressure; above that temperature, the increase is still more rapid; as the next 20 deg., increases the pressure to 6 atmospheres; at 338 deg., its pressure is 8 atmospheres; at 356 deg., it is 10; at 400 deg., it is 20; at 450 deg., it is 30; at 485 deg., it is 40, and at 500 deg. it is 50 atmospheres—a pressure of not less than 750 pounds to the square inch, and not practically used in any engine.

S. M., OF BOSTON.—Wedgewood's Pyrometer is entirely unreliable. Experience has shown that a longer exposure to a lower heat gives often the indication of a higher temperature than the shorter exposure to a decidedly higher heat, and *vice versa*.

DENTIST, OF NEW YORK.—The alloy you refer to is probably the so-called Wood's Alloy. It contains no mercury, but is a compound of 8 parts of bismuth, 4 of lead, 2 of tin, and 2 of cadmium, and melts at 150 deg., Fahr.

AMATEUR, OF PHILADELPHIA.—The handling of mercury may most decidedly, become very injurious, when spilled on the floor of your room. When lost in the cracks, it poisons the atmosphere for years with its imperceptible vapors, which, when inhaled, habitually produce a train of alarming symptoms; some powder of sulphur placed in the cracks suspected to contain drops of mercury, will neutralize the effects by absorbing the vapors.

NEW PUBLICATIONS.

A CONVERSATION ON MINES, BETWEEN FATHER AND SON. By WILLIAM HOPTON, Colliery Manager, St. Helens, Lancashire, England, and Author of "The Lund Hill Mode of Ventilation," etc. *Third Edition, Seventh Thousand*, 1868. Price $1. WESTERN & COMPANY, Agents, 37 Park Row, New York.

This volume of about two hundred pages is written by one who has had a large experience in the working of coal mines. He speaks, therefore, from a *practical*, as well as a scientific point of view. All the important questions of coal mine ventilation, surveying, etc., are discussed in a clear, familiar style. It has been the object of the author to present a work to the mining public that will come within the province of those who are engaged as actual laborers in the coal fields. In that he has succeeded most admirably. The nature and properties of the various kinds of noxious gases that are generated in mines are very clearly explained. So clear, in fact, that those of no scientific attainments whatever cannot fail to comprehend them. The first and second editions have had a large run among coal miners and managers in all parts of the world, where the English language prevails. The work should have a very extended circulation among the coal men of our country, as the price, in comparison to the large amount of useful information contained therein, is but a mere trifle. The retail price is put down at the very lowest figure, in order to bring it within the reach of the masses. We will send the work to parties desiring it, immediately upon the receipt of orders therefor, at the above rate, prepaid.

A TREATISE ON STEEL; *comprising its Theory, Metallurgy, Properties, Practical Working, and use.* By M. H. C. LANDRIN, JR., Civil Engineer. Translated from the French, with notes, by A. A. Fesquet, Chemist and Engineer; with an Appendix on the Bessemer and the Martin processes for manufacturing Steel, from the report of Abram S. Hewitt, United States Commissioner to the Universal Exposition, 1867. Philadelphia: HENRY CAREY BAIRD, Industrial Publisher, 406 Walnut street.

Beginning with a history of steel, the author next examines the various fuels employed in metallurgy, the substances which in the ore and the fuel are capable of influencing the qualities of iron and steel, the different ores in use, and then passes to the theory of the formation of steel. This is followed by a method of quantitative analysis for iron, steel, or pig metal. A large amount of space is therefore devoted to the metallurgy of the various kinds of steel, natural, cast, puddled, steel of cementation, etc. Special attention is, moreover, given to the manufacture of pots for casting, and to the new processes known under the names of Chenot, Bessemer, Uchatius, etc. After examining the character of certain mixtures of steel with other metals, the various operations by means of which steel is welded, hardened and tempered, are fully discussed. Some of the uses to which steel is applied, such as the manufacture of files, steel wire, steel plates and saws, are then noted. Within the small compass devoted to this work, a full insight is obtained of the whole question of the manufacture of steel. In order to convey an idea of the present steel industry, some extracts are added, from the valuable report made by Mr. Abram S. Hewitt, U. S. Commissioner to the Universal Exposition at Paris, in 1867. The object of this author has been to extend a knowledge of a useful and necessary metal, and his work is worthy of a careful perusal and consideration by those interested in the manufacture of this metal, or in the uses to which it is applied, and should have a prominent place in the library of every metallurgist and mechanic.

Original Papers.

[PREPARED FOR THE AMERICAN JOURNAL OF MINING]

THE CHEMICAL EFFCT OF STEAM ON METALLIC SULPHIDES AT A HIGH TEMPERATURE

NUMBER FOUR.

BY DR. ADOLPH OTT.

From the foregoing it follows that metallic sulphides, which do not yield any sublimate of sulphur at a high temperature, combine with steam and become slowly decomposed, in such a manner that the sulphur is set free, forming sulphide of hydrogen, the metal uniting with the oxygen, forming an oxide, provided the metal has sufficient affinity for it at a high temperature. If the metallic oxide gives off *its oxygen* easily, it will combine with the sulphur of the undecomposed sulphide; sulphurous acid will be generated, which, when coming in contact with the sulphide of hydrogen, will form water and sulphur. According to circumstances, beside the sulphide of hydrogen, pure hydrogen, sulphurous acid and sulphur will be set free. If the metal of the sulphide is capable of decomposing the water, or if its oxide (as the oxides of iron and copper) readily yields its oxygen, it will remain at a low stage of oxidation, as, for instance, iron and copper as protoxides, and if it has no affinity for oxygen at a glowing heat, it will remain in a metallic form, as is the case with the silver, which, even when it absorbs oxygen, under certain circumstances, easily gives it off again. If the sulphides and the oxides formed are volatile, oxysulphides will be generated, which, in the same manner as the oxysulphides of antimony and arsenic, will be carried away.

The results, however, are not the same, if in the decomposition of the metallic sulphides by steam the air and the gaseous products of the combustion of the fuel are allowed to have access. The steam will act on the sulphides as before indicated, and the air will at the same moment become active, in fact, will hasten the oxidation of the sulphur. The sulphide of hydrogen formed with the sulphur which has been set free by sublimation will be consumed and sulphurous acid will be generated, which becomes partly converted into sulphuric acid. The oxides not only absord more oxygen, but also sulphates are formed, which remain intact under ordinary circumstances. The longer, therefore, the mixed air and steam are acting on glowing metallic sulphides, the result of the roasting will be more satisfactory than by desulphurization without steam.

Experiments on a small scale prove that the decomposition of the metallic sulphides by steam alone is in most cases only effected at a much higher temperature than that which is necessary for roasting by the exclusive access of air. Again, the former requires a much longer time than the latter at a greater expense of wages and fuel. It is therefore self-evident that the roasting by steam is only adapted to certain cases, particularly where a thorough separation of the arsenic and antimony is intended; or in the desulphurization of very rich silver ores where a considerable loss of silver would otherwise occur.

ON THE USE OF STEAM IN THE ROASTING OF ORES AND METALLURGICAL PRODUCTS.

Steam has thus far been used with satisfactory results in the desulphurization of iron ores which are blended with iron- arsenical- and other pyrites, for sulphurous copper ores and their products, and also for rich silver ores, as was proposed by PATERA.

The first experiments on the roasting of iron ores with access of steam were made in 1843 at the iron works at Dalsbruck, in Russian Finland. According to NORDERSKJOELD they were so satisfactory that the process was soon afterwards introduced in Finland and in the Ural Mountains, and it has since becom extensively adopted.

If iron ores in pieces of ordinary size are roasted in a furnace heated by a wood fire and with access of steam, and if the ores are of such a nature that by subjecting them to a mere red heat, they acquire sufficient porosity in order that the gaseous products of combustion together with the steam will find their way into the interior, we may well suppose that the respective pyrites will be decomposed and that their metals will be more completely changed into free oxides than would be the case in the desulphurization without steam. The result however, will be less satisfactory if the ores are too compact, and if they do not become porous at a stronger heat, as is the case with magnetic iron ores and hematite, or if the ores are not sufficiently broken up.

Though fuel, and furnace gases, or inflamable gases that are directly generated are most desirable for such a desulphurization, as they do not burn with a sooty flame, bituminous coals are nevertheless often used.

At charcoal blast furnaces where they have great quantities of coal dust, the latter is frequently used in the desulphurization of iron ores. The chimney furnace without blast is also sometimes used. If the ores are intended to be kept at an elevated temperature, some defects will necessarily be noticed—viz: the coal dust in filling the interstices will not only diminish the draft, but also decompose part of the steam. Some portion of carbonic acid gas, a greater portion of the carbonic oxide, and still more hydrogen will be generated, which gases will considerably diminish the otherwise energetic action of steam upon pyrites.

A similar result would be obtained if carbonaceous iron ore, which sometimes contains thirteen per cent. of carbon, should be roasted with access of steam.

In the Altai Mountains they also roast copper matt with 45 per cent. of copper, beside sulphurous copper ores in the manner described. Not only time but also fuel is saved by the new method, and in smelting the calcined matt, a regulus is obtained, which is less contaminated with antimony than if the roasting was carried on in kilns.

Correspondence.

[To insure insertion of correspondence in our columns, the full name and address of the writer must be given.]

From the Rocky Mountains.—No. IV.

THE SILVER VEINS AND METALLURGICAL FURNACES OF COLORADO.

Two classes of veins occur, in one, the silver is associated with galena. This is the most frequent. In the other the silver sulphuret is disseminated in quartz. The silver or gold veins in this territory do not seem to attain a very great width, being generally from two to five feet, and seldom exceeding ten feet. Their general course in Georgetown as at Central City. is N. E., S W., and those which I have seen in both districts, are nearly perpendicular.

In the Equator lode, which is considered one of the best, though I did not go under ground, I could see by the character of the ore on the surface, and learned by inquiries, that the vein was four or five feet wide, and the galena generally one foot, sometimes even as wide as two feet. They had two shafts, each about 100 feet deep on the vein, and both in ore. This may be taken as an example of the galena veins of the district, being wider however I believe, than the most of them. The first class ore in this lode is considered to have $500 a ton, of silver, and is being sent to Newark, N. J., for treatment. The poorer class is treated at the German Amalgamation Works, Georgetown. All my experience of galena veins bearing silver is, that they are generally narrow and unreliable in duration, and though often giving handsome results, can never be expected to produce great masses of ore, as the Comstock or the great Mexican lodes have done. The method of reduction by smelting and cupellation adapted to this class of ores, is simple and economical, owing to their easy fusibility. I also visited a mine on the other class of veins, not bearing lead in any large quantity, and having sulphuret of silver disseminated through the quartz. It is named the Astor, and is about 3,000 feet above Georgetown, being some 12,000 feet above the sea. The snow banks, notwithstanding their having been exposed to the summer's sun occur all around, and the mine is situated on the line where the timber ceases.

The attempts of some cedar trees at vegetation are to be seen there, exhibiting themselves in rather a remarkable manner. Instead of growing upright, they run flat along the ground like creepers throwing up their branch-like shrubs, the trunk lying in the direction of the prevailing N. W. wind. They look exactly like weeds which have been washed into a lying position by a flood of water having passed over them.

No upright tree could sustain itself on the ridges at this height against the winter gales. The Astor vein is wide, but much mixed up with the surrounding rock and will probably clean up, and show its walls clearly at a greater depth though what the gossan runs into, whether mundic ores or galena remains to be seen—in my opinion it will be the first, and I should have more confidence in this, than in the galena class of veins, though the immediate results are not so flattering.

These non-lead-bearing lodes, the Astor, Mexican, Nuckolls, &c., are all north of the town, while the galena ores are south and west of it. The ores of this kind are all treated by amalgamation.

On descending to the wooded region, from the mine, the log-huts the miners had built for themselves in the forest

were to be seen, the roofs being formed of slabs of pine bark peeled off from the trees. One of each mining party is told off for cooking duties, and was spreading the table in front of each hut, for the mid-day meal. Adits to a considerable depth and not of a very great length can be run so as to cut all the Georgetown veins, owing to the precipitons nature of the mountains, but it seems to me that from their being so far in the mountains, an adit from the level of the town would be a work of too gigantic a nature to be undertaken, except in case of a great production of silver. However, veins which are not at present known may be discovered by such a work at no great distance from the valley. My observations refer to the lodes already worked, and considered rich. There are two establishments for extracting the silver ores, a reverbatory smelting furnace, under the management of Mr. Herrick and what is called the German Amalgamating Works, in which the ore is roasted in a revolving horizontal cylinder of boiler plate, lined inside with fire bricks, and through which the flame of a fire plays, the stamped ore being thrown on the inner surface of fire bricks, the smoke passes off through a flue communicating with the end of the cylinder opposite the furnace. The object is to stir the ore by mechanical power and save the labor otherwise required. The ore, before introduction into the furnace, is stamped dry and mixed with a sufficient quantity of salt and pyrites to cause the chlorination of the silver during roasting. After this, it is treated by the ordinary German system of barrels.

Both these establishments are on rather a small scale, and doubtless they will be enlarged, or others established, as the production of the mines increase. I think the mines of Georgetown offer inducements for the investment of small sums by parties residing on the spot, who can personally superintend their business. As soon as the mines become deeper, of course large capital will be required for working them.

Coal Deposits.

I have not been able to see the coal beds, the outcrops of which occur along the base of the mountains, having been exposed by the upheaval of the range. They have been worked on a small scale by the Union Pacific Company, west of Cheyenne, also in Boulder county, near Denver, and on the Arkansas some 200 miles south of that town. It is doubtless allthe same formation, and probably passes under the plain around and east of Denver. A bed three feet thick was, I am told, found, on sinking to a small depth some distance down the Platte, but a boring of 170 feet in Denver failed to find coal. From the specimens I have seen of that found near Denver, it seems to be mostly of a friable nature after exposure for some time to the atmosphere, though of good quality in other respects, approaching the character of lignite. It is also liable to spontaneous combustion when heaped in large quantities, as has happened several times with stocks laid in by the Union Pacific Company. These are indeed serious drawbacks to its utility, but some specimens I have seen from the Arkansas, seem to be of a better quality, being compact, like ordinary bituminous coal, even after exposure. That found round Denver is used for domestic purposes, and by blacksmiths when mixed with charcoal. I believe it has not been determined whether this belongs to the carboniferous period, doubts having been raised by the Government Geologists. Some of the beds are from eight to twelve feet thick, I am informed, but am sorry to say I was unable to visit the drifts, the nearest being 16 miles from Denver. D. Coghlan.

Scientific Meetings.

THE NEW YORK SOCIETY OF PRACTICAL ENGINEERING.

The stated fortnightly meeting of the Society of Practical Engineering was held on the evening of Tuesday, Sept. 29th, at Room 24, Cooper Institute. The President, James A. Whitney, in the chair. W. B. Harrison, Recording Secretary.

The assembly consisted mainly of engineers and inventors, interested in the progress of Arts and Science of the present day.

The nucleus of the evening's proceedings was a most instructive paper by Mr. L. Holms, of Paterson, New Jersey, upon the Filtration of Water for Industrial and Domestic Purposes.

A comparison was instituted between the people of the present day and the inhabitants of ancient Rome, in the use of the cleansing element of water, not at all favorable to us. It was proved that while 20 gallons per day was considered an ample supply at the present time, that in Rome the daily supply was 312 gallons to each individual. The *kind* of water drank at present by the inhabitants of large cities was shown to be dangerous to health; and where circumstances were favorable, a sure promoter of fatal diseases. The fact that no filtration whatever is in use by the water works in the United States, is such an extraordinary state of things that few are prepared to credit it; yet, according to the author, such seems to be the case.

Mr. Holms exhibited many excellent diagrams of the various modes of filtration practised in Europe, and gave minute details of their construction. He also explained drawings of a new system of filtration now being brought to the notice of paper manufacturers, which is capable of being extended to municipal purposes. This filter is not an open filter, as the large European filters are, but works under pressure in strong iron cases—the medium of filtration being a sort of elastic carbonacious material, admirably adapted for the purpose. The European filters were shown to be almost impract cable for this country on account of the immense area necessary, almost 24 acres, to filter the water for this city. On the other hand, the new filter could be placed in a building, on the line of the mains, of quite moderate dimensions. The construction of the European filters would cost $2,000,000, and $100,000 per year to operate them. The new filter would cost about $500,000, and $20,000 a year for attendance, etc. The interest, depreciation and attendance would be equal to about $70,000 per annum, or seven cents a head for one million inhabitants, who, for this sum, would have 23,000 gallons of water filtered, or upwards of 3,600 gallons for one cent.

This being so, why is it that we of this large and prosperous city cannot get a glass of pure water?

The reading of this paper deservedly attracted much attention in the Society, and it ought to be generally read and understood by the aggrieved public.

Dr. Burson exhibited his patent wheel, designed for the propulsion of steam vessels. It very much resembles an ordinary paddle-wheel, with the exception that by moving in guides attached to the sides of the vessel the paddles are "feathered" when presented to the water.

The Society meets again Oct. 13th, when a paper will be read on the propulsion of city cars by compressed air.

POLYTECHNIC BRANCH OF THE AMERICAN INSTITUTE.

Water Meters—Study of History—Advice to Patentees—Chair Springs—A New Lamp Top—Condenser Tubes—House Heating Furnaces.

The regular weekly meeting of the Polytechnic Branch of the American Institute was held on Thursday evening, October 1st, Professor Tillman in the chair. The attendance was good, and much interest evinced by all present.

Mr. Kreusbaur exhibited drawings of his water meter, and explained its operation. This meter has two pistons, working alternately, enclosed in a cylinder. The packing of these pistons consists of a ring of rubber that rolls upon the surface of the piston, by contact with the inner surface of the cylinder that encloses it. In addition to efficiency, cheapness of construction was claimed, as by means of the peculiar mode of packing, no turning or smoothing of either pistons or cylinder was required, beyond that possessed by ordinary castings.

Mr. Zuba, a Polish gentleman, then took the stand and gave a lecture upon a method of studying universal history. He exhibited a large chart divided into nineteen squares representing each a century. These squares were subdivided into four equal spaces by two lines, crossing each other at right angles, and in each of these squares were twenty-five divisions, each representing one year, which was also divided into nine spaces. By the position of a certain character of a certain color, placed in these squares, it indicated that in that year an important event as shown by the symbol, occurred.

Mr. Stetson then took the stand, and read a paper upon the relations of manufacturers to inventors. He argued that but very few inventors were capable of successfully bringing out and introducing their inventions to the public. Capital and business talent were required for this—and these he was sorry to say were rare attainments of the inventor. He also gave some good advice that would be of benefit to these interested, regarding the sale and disposal of patents. At the close of his paper, many remarks were made, and some points of patent law discussed.

Blake's patent chair springs were then shown. These springs are made of a coil of tempered steel wire, and are intended to make a spring chair and a rocking chair out of any common chair, by attaching them to the front legs of the chair.

Grosvenors patent safety lamp top was then exhibited and explained. Its close or air-tight construction, excluding air, causes the lamp to be filled as the oil is exhausted, with the fire-extinguishing substance, known in chemistry as carbonic acid gas, which, being generated by the combustion at the top of the wick, is passed down through the tube by the weight of the atmosphere.

Mr. Emery exhibited several condenser tubes that had been used with an engine that derived its boiler feed water from a situation where much sewerage work was taken up. The tubes were honey-combed or eaten full of holes. The tubes are the same as those used for marine service, which are not affected in this manner. The question was raised, was it the effect of acidulated sewerage water, or the effect of galvanic action induced by imperfect amalgamation of the metals, or foreign matter contained in the metal.

At the close of the meeting a gentleman exhibited some drawings of a new method of heating buildings, but not being blessed with a happy method of describing his plan for drawings, he was not very well understood by the audience who seemed impatient to leave.

Manufacturing and Mechanical Notes.

No. XXXIV.

Lindsay, Walton & Co's Improved Tools.

Every mechanic, no matter what his ability as a workman may be, regards all improved tools with a degree of pleasure, and the employment of such tools gives good results, inasmuch as it has been observed that the putting of improved appliances into the hands of employees gives a stimulus to a better standard of work.

Probably the most common tool in use is the slide or screw wrench, and one in demand by all classes of mechanics and is indispensable where machinery is used. Being made adjustable to any size of nut or bolt head, it is as perfect a tool in this respect as could be desired. Probably very few mechanics ever gave a thought toward its improvement, yet with rough usage, it was observed that the bar would bend, and occasionally the sliding jaw would become broken where it clasped the bar. This defect has been obviated by a very simple expedient, which is the invention of Mr. J. P. Lindsay, a member of the firm of Lindsay, Walton & Co., successors to Waltons & Leonard, 58 John street, New York City. The improvement, as seen in Fig. 1, consists in adding a fin or rib to the back and extending it some distance toward the handle of the wrench; this presents a brace and a resistance to the bending or springing of the bar and also prevents the head of the implement from being bent from the bar by any extraordinary force applied. To receive this rib at the back of the movable jaw it is made a little larger, which gives it greater strength and also acts as a resistance to the lateral deflection of the movable jaw.

Fig. 1.

In addition to the improved wrench, we observe an Improved Lathe Dog, Fig. 2, which will please every one who has occasion to use such tools. In the construction of lathe dogs it is essential to make them light, and so proportion the metal throughout the various parts that it may be as nearly balanced as possible when in use. To accomplish this the body of the improved dog is made hollow like a tube, thus giving greater strength with less weight of metal. In addition to this the dogs are made so thin that the tool can be used close to the center. The screws are steel and hardened in such a way that they are not easily broken.


Fig. 2.

A self-feeding Drill Lathe, seen at A, Fig. 3, a ratchet, B, and also a B ace drill, C, upon the same principle as the lathe,

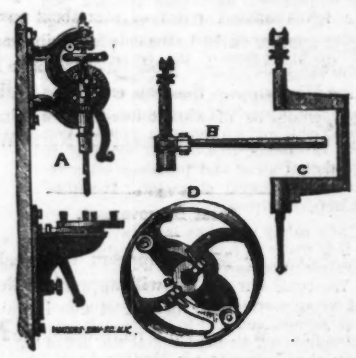

Fig. 3.

are other improved tools. The ratchet drill in particular has none of the objectionable features formerly found in that implement. The ordinary ratchet is replaced by a wheel having a smooth periphery, and secured between two plates by a nut upon the top of the plates, the latter also having the handle of the wrench secured between them by a bolt. The apparatus is rendered self-feeding by a simple friction device arranged at the top of the screw-rod in such a way that the cut of the drill may be regulated at will by tightening or loosening a "cone-nut."


Fig. 4.

A Friction Clutch Pulley, which is shown at D, Fig. 3, is designed to take the place of the ordinary tight-and-loose pulley, and while it answers the same purpose, it does away with all friction of the belts in the action of changing from one to the other.

Wrought Iron Tackle Blocks, Fig. 5, are another article furnished by this firm, which are far superior to the old fashioned wooden contrivance that has so long held a place where heavy weights are to be raised. All danger of breakage of either block or sheaves is entirely obviated, as nothing but the best material is used in construction. They are furnished singly or in pairs, and are made with one, two, three, or four sheaves, as are required.

In addition to the improvements illustrated, Messrs. Lindsay, Walton & Co. are manufacturers and dealers in all kinds of machinists' and railroad supplies in use.

For something like one hundred years (says an English paper) a fire has been burning in the disused workings of the Bank Pit Colliery, at Parkgate; and on more than one occasion it has threatened to break through into the workings of the colliery belonging to Earl Fitzmilliam. About twenty years ago this danger was imminent, and a thick bank wall was erected to avert it. During the recent dry weather the ground in the neighborhood has cracked, and it is supposed a current of air has found its way into the workings, causing the fire to spread. There is danger of its breaking through into the earl's collieries.

Important from Washington.

Department of State,
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To Wheeler & Wilson, New York:

Sirs: This Department has received ONE GOLD MEDAL, awarded to your firm on Sewing and Button-hole Machines at the Paris Universal Exposition of 1867.

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Mine Engineering.

Our readers will find in another column of to-day's issue, the advertisement of HARDEN & SON, Mining and Mechanical Engineers. Their endorsements are of the very best. We make no doubt that twenty years of experience in the science and practice of their art, will tell largely and to the point in anything they may undertake. Of Mr. J. W. Harden's scientific and practical knowledge, our readers, who have followed him through his series of papers on the subject of "The Ventilation of Coal Mines," cannot fail to have a clear perception. We hope that his career as a practical engineer will always meet with the success that has fallen to his lot as one of our highly valued contributors.

New Firm.

Our readers will observe by reference to the Manufacturing and Mechanical notes of this week's JOURNAL OF MINING, that we have selected a few of the important implements from the extensive stock of Railroad and Machinists supplies of Messrs. Lindsay Walton & Co.

This new firm are successors to the late firm of Waltons & Leonard.

The members of the present firm are John P. Lindsay, President of the Manvel and Lindsay Machine and Wrench Company.

Joseph J. Walton, of the late firm of Waltons & Leonard, and James H. Lyles, the editor and compiler of Asheroft's R. R. Directory, a recent publication, favorably known to machinists.

All Sorts.

☞ Green pigments have been in such bad odor for years, on account of their real or imagined poisonous influence, that chemists have labored hard to find a form of the favorite color that shall be above suspicion. Success appears to have crowned their experiment at last; for a new preparation of a salt of chromium, invented in England, yields a green coloring powder that leaves little to be desired. It is brilliant in tone, perfectly harmless, and possesses other requirements of a technical character. It will be known as Imperial Green.

☞ A new safety lamp has been invented in France. It is really an inclosed moderator lamp with a reservoir of compressed air to feed it. It is said to be applicable for illumination under water, but we are not told how the products of combustion escape, and fail to see how it can answer. Compressed air necessitates the use of a heavy metal reservoir, which miners, probably, will refuse to carry about.

☞ The report of the National Cotton Manufactures Association states that the number of cotton spindles in the United States has increased from 5,250,000 in 1863, to more than 7,000,000 at present. From the returns made to the association, it also appears that the cotton mills north of the Potomac actually consumed over 900,000 bales in the cotton year from September 1st, 1867, to September 1st, 1868, and possibly over 1,000,000 bales.

☞ The last clean-up of the Eureka mine, at Grass Valley, Nevada county, after a run of two weeks on a comparatively poor class of rock, yielded $19,300

☞ The sarike at Troy has edtirely ended. Work has been resumed in the iron establishments of Messrs. Burden & Sons and E. Corning & Co., which have been closed over four months on account of the strike.

☞ During the month of August the bullion yield of the Gold Hill (Nevada) mines is stated at $700'000 being the largest amount ever oroduced in a single month by the mines of that district.

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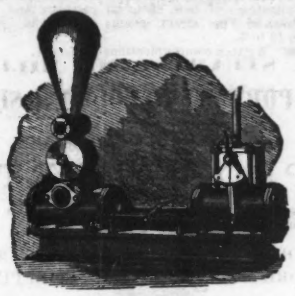

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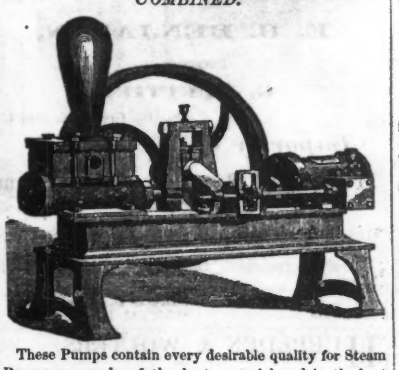

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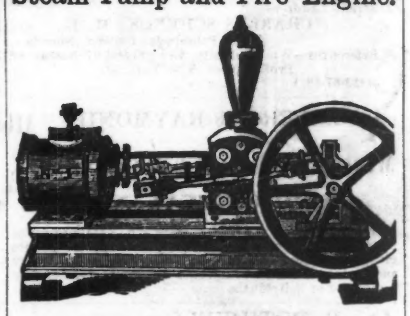

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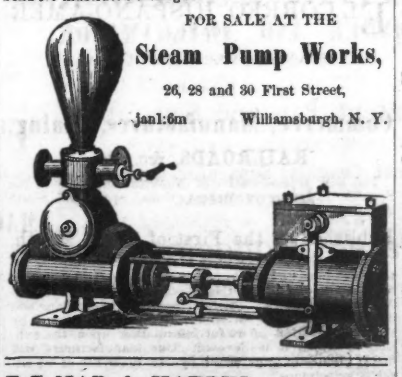

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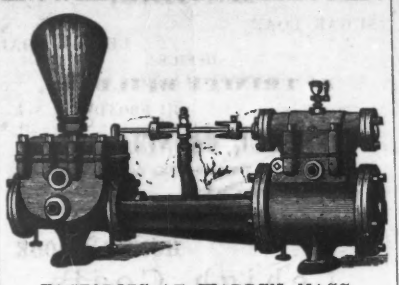

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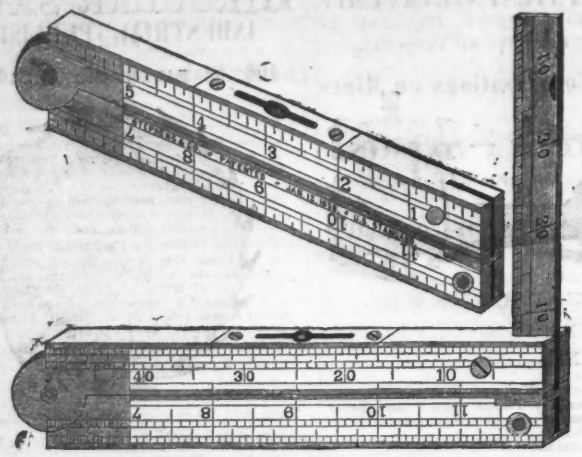

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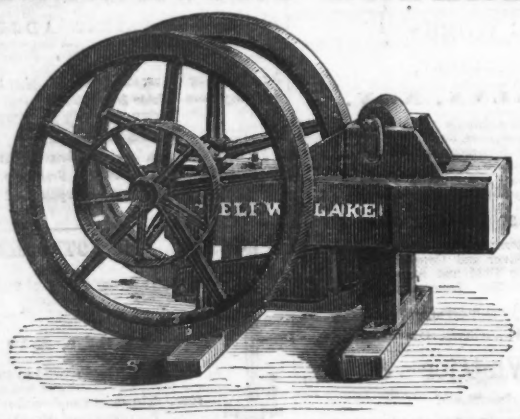

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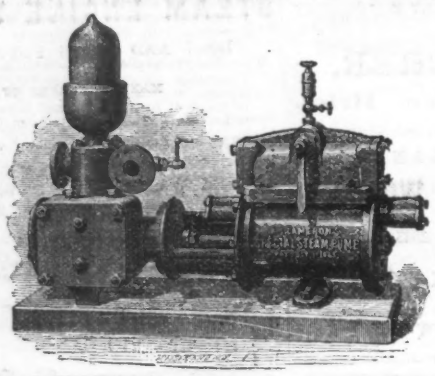

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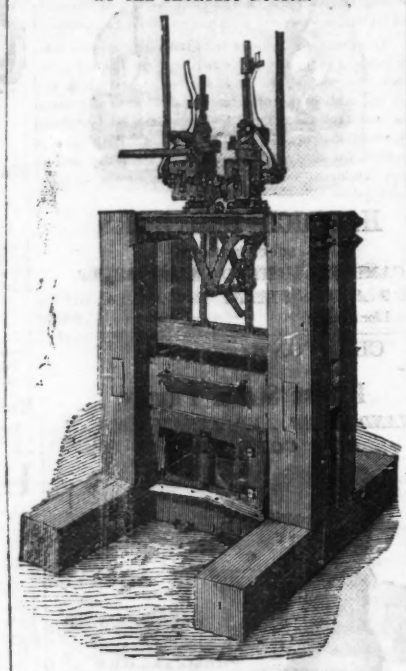

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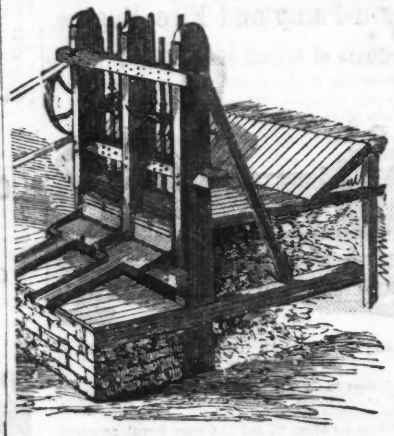

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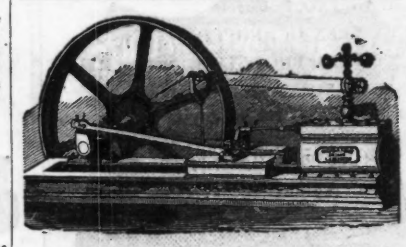

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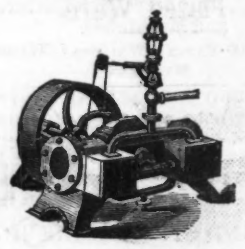

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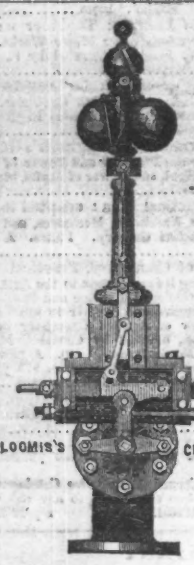

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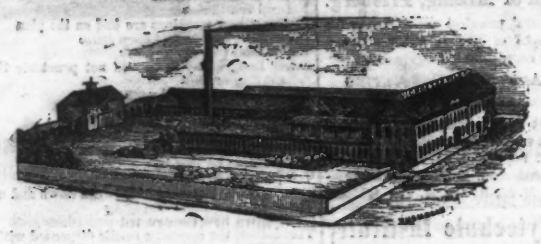

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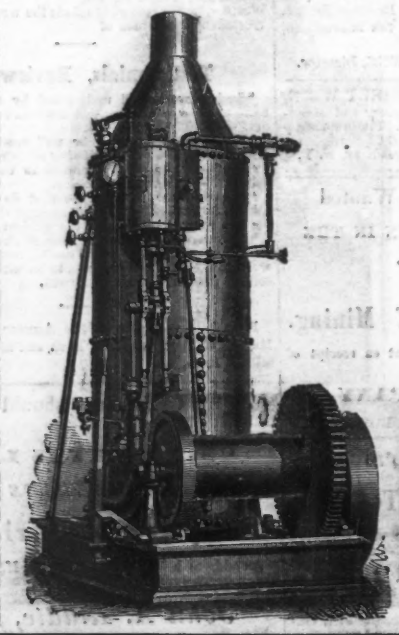

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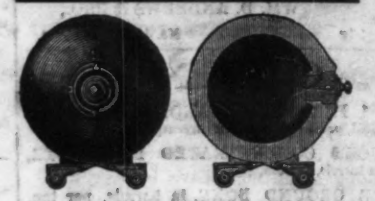

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