Correspondence

EDITORIAL CORRESPONDENCE.

The Alleghany Bituminous Coal Field—Steubenville Mine—Coking Ovens.

STEUBENVILLE, May 30, 1862.

The distance from Wheeling, Pa., to Pittsburgh, Pa., is ninety five miles by the railroad which on the Ohio shore follows the windings of the river. The morning was fair, the sky was clear and the odors of flowers and tree-blossoms filled the breeze as I was wheeled along by the iron horse. The scenery was delightful, the ride exhilarating. This section of the country appears to have been a table land out of which the Ohio river has scooped its channel, leaving a series of rolling hills ranging from about five to six hundred feet on each side. The elevations resemble large mounds, separated by ravines. The soil is fertile, the hills are covered with verdure and cultivated to the summits. Planters mansions nestle among the trees on the hill sides, and cheerful villages stud both the Ohio and Virginia shores. The scenery is not grand, because no lofty mountains are seen towering in the distance, still it is certainly picturesque. The Virginia side of the river here is the celebrated "Pan Handle" track, and in spite of its uneuphoneous name is a lovely region. The hills contain plenty of coal as this is a portion of the Alleghany Great Bituminous Coal Field. The top seam of this field is exposed along the Monangahela, Alleghany and Ohio rivers, and has been called the "Pittsburgh seam" because it comes out so near the top of the hills in the vicinity of this city. The superficial extent of this seam is about 14,000 square miles. In some places it is found about fourteen feet in thickness, at Pittsburgh, it is about six feet, then it diminishes gently to the west and northwest to five feet. It has a dip due south of about twenty feet to the mile. In proceeding up the valley, the mines may be observed in various places cut into the face of the hills, and by drawing a line through these from Wheeling up to Pittsburgh, an incline of several hundred feet will be described. The mines near the top of the hills contain little or no fire damp, the coal is more free from sulphur, is softer, and can be coked in open pits. About four feet of the top of a six-foot seam scarcely contains any sulphur and it is excellent for iron smelting. But we have arrived at Steubenville, about twenty six miles from Wheeling, and here we stop to examine the most peculiar coal mine in this section of the country. The place is pleasantly situated on the right bank of the river, and like many of the villages and cities on the Ohio, it resembles an English town. Most of the houses are of brick and are covered with a faithful coating of soot. The coal mine is located near its west end on the hill and belongs to L. Borland & Co. Instead of working in the common top seam of coal by driving a horizontal tunnel into the face of the hill, they have sunk a vertical shaft—a pit—240 feet deep, exactly like an English mine. In sinking this shaft, two other smaller seams of coal were passed, until the present one which is worked, was reached. It is about 4 feet thick, but its great virtue consists in being free from sulphur, and its coal, thus possesses qualities, which when coked, render it about equal to anthracite for iron smelting. It is shiny and somewhat harder than the top seam of this field, which lies about 600 feet above it. The shaft of this mine is 16 feet long by 8 feet wide, and is divided in the middle by a partition. A strong frame extends above the mouth of the pit, or rather it may be called two mouths. A wire rope passes from the windlass of the engine over sheaves on the top of the pit frame, and is attached to two hoisting platforms, one of which descends one division of the pit with an empty coal carriage, while the other is ascending the other division with a loaded one. Like two large dumb waiters, the hoisting platforms are guided in grooves in the pit framing, and the system of operating is simple, convenient and very safe. When a loaded carriage is raised to the top a few feet above the pit mouth, it is run off and tipped upon an inclined screen which separates the small from the larger pieces of coal. At present only about one hundred tuns per day are mined. About three tuns per day are mined by each collier, who receives fifty cents per tun for the larger coal and fifteen cents for the fine coal. The mine is operated exactly like those in England; the working rooms are about thirty square feet in size and pillars of coal are left to support the roof, which is smooth sandstone—an excellent roof for the miners. Salt water filtrates through this seam of coal, and a saline efflorescence covers the ground around the engine house.

The mine is ventilated by a fire in an up-take side shaft. The fresh air passes down the working shaft, thence through the miners' room, and passages, and up the draft shaft to support the fire maintained in iron creel near the shaft top. A wagon lifts half a tun from the mine; the hoisting and lowering are performed by a horizontal steam engine and a reversible hoisting windlass. The engine is not stopped and reversed, as by the old-fashioned English giging method. The large coal sells in Steubenville for one dollar per tun, the small for 60 cents. The slack made at this mine is roasted in ovens, and converted into coke to be used for iron smelting. Twelve coking ovens, resembling large old fashioned brick ovens for baking bread, are employed by this company. It is roasted for about three days. This treatment expands 100 bushels to 125, but each bushel weighs 70 lbs. when it goes in, and only 38 lbs. when it is taken out of the oven. The coke made from this lower seam of coal is clean, hard and of a superior quality. The coals, shales and sand stones obtained in this mine contain well defined fossils. You can even trace the forms of antediluvian ferns in the coke as it comes from the ovens. When burning the printed leaf of a book, sometimes the letters appear more clearly defined, so in like manner the coking of this coal makes the more delicate organisms of which it is formed stand out more sharply. Near the rolling mill in Steubenville, a shaft has just been sunk, and this vein of coal reached, in order to use it for iron smelting. A shaft had been previously attempted within the precints of this mill, but in sinking it, a bed of quicksand stopped the operations. In several instances we have known of quicksand closely adjacent to river bottoms, stop the operations of shaft sinking. We do not know how extensive the lower seams of this field are, but in all likelihood they cover as great an area as the upper seam, for they have been found at Pittsburgh sixty miles distant. Its superior qualities, however, were unknown until recently. This region is rich in useful minerals. Limestone and grindstone grit are found above the upper coal seam, and potters' clay, fire clay and petroleum and salt springs are found all along the Ohio valley.

This great coal field, extends into and over the eastern side of the Appalachian chain of mountains. Its greatest breath is 100 miles, its longest diameter 225 miles. None of this coal comes to our eastern cities excepting moderate quantities of the Cumberland variety, through Maryland. It is the only coal however, which is used in Western Pennsylvania, Western Virginia, in many sections of Ohio, Kentucky and Indiana. Not only does the United States possess a far greater coal area than all the known world beside, but her coal seams are more easily worked than those of any other country. Our people cannot sufficiently prize the blessings conferred upon them in our vast and easily worked coal seams. No correct statistics have been kept of the quantity of bituminous coal that is mined annually, but it cannot be less than about 3,000,000 tuns, for half a million tuns are consumed yearly in Pittsburgh alone.

OUR LONDON CORRESPONDENCE.

American Inventions—Minerals and Oils.

LONDON, May 23, 1862.

MESSRS. EDITORS:—The Great Exhibition is now fairly open, and one can begin to study it as the living center of the world of industry, art and science. Nearly a month has passed since, at its opening, it was called "the most honored offspring of civilization." Since then all has been bustle and confusion, and the sounds of the hammer and the saw have been mingling daily with those of discordant organs, pianos and hundreds of other instruments. New wonders and beauties, however, have been gradually unfolded, and now the visitor may study almost every device under the sun, required for the use of man, while the most cultivated imagination may here revel in the displays of exquisite works of art. In this great depository of industry and art, lessons of the past are full of suggestions for the future. There is but little now in use in the mechanical and chemical arts which has not been invented within a life time. The lathes, engines, looms and agricultural implements in use thirty years ago, have mostly become relics of a past age. Perhaps the visitor to a like exhibition fifty years hence (1912) will judge our productions as we estimate those of the past century. That which we call the perfection of engineering and mechanical skill now may be estimated as crude efforts by the next generation. Such has been the case during the past—such will be the case in the future.

In looking (with a partial eye, I must admit), over this vast assemblage of man's productions, collected from almost every nation on the face of the globe, I am proud of our Yankee land. Though our direct contributions are as but one in two thousand, the impress of American ingenuity for saving labor is visible in all our machines, tools and implements. And I am vain enough to predict that, in the aggregate, the various nations represented here will be more benefited through the contributions of our 150 exhibitors, than by any 1,500 contributions in the whole list of 30,000 now entered. This may appear to be a boastful claim, but I do not think it is extravagant. I have waited for weeks that I might write advisedly, and in subsequent letters I will relate more fully what has been done by those of our contributors who have ventured here under very discouraging circumstances.

I will close by mentioning a few of our articles. Dr. Feuchtwanger, of No. 42 Cedar street, New York, has sent a splendid cabinet of minerals, consisting of more than 1,000 specimens, collected with great care from different States of our Republic. They attract much attention. T. D. Meads, of Michigan, has a choice collection of about 200 minerals, from the Lake Superior region. These are very beautiful. I have also a small cabinet collection from the mines of Col. Fremont, and another from Mr. Mosheimer, of the Washoe silver mines, California. The New Jersey Zinc Company exhibits some interesting specimens of the products of their mines and manufactures. In class No. 2, M. H. Bayley, of 61 Canal street, New York, exhibits samples of his crystal carbon oil, and F. S. Pease, of Buffalo, N. Y., has sent samples of his refined petroleum. These samples, I am sorry to say, have been ruled out of the building by the Royal Commissioners, from the wrong notion that they are explosive. I know them to be perfectly safe from explosion under all ordinary circumstances. A. Hale and Mr. Hotchkiss, of Lyons, N. Y., have sent samples of essential oils, and the Philadelphia College of Pharmacy has sent an interesting collection of American roots, herbs, &c. Yours, J. E. HOLMES.

Time is Money---Recollect That.

Anything which will give you a hint as to doing your work or accomplishing your ends in quicker time or with less labor, is equivalent to hard cash. We venture to say that there is not an honest trade or occupation known among the sons of men, in which its followers would not be benefited and enabled to save much time by faithfully studying the SCIENTIFIC AMERICAN. Farmers, mechanics, manufacturers, men of science and genius, see to it that the SCIENTIFIC AMERICAN is ever upon your table. Let it be your intellectual whetstone. Next week we commence a new volume. Be sure and send in your names as subscribers.

J. W. FAWKES is now in Illinois with his steam plow offering to plow the fields of the farmers by contract. The *Prairie Farmer* calls upon the farmers to give him encouragement, so that the relative economy of plowing by steam and animals may now lie fairly tested on the prairies.

FROM twenty counties in Illinois and Iowa alarming accounts have been received by the ravages of the wheat midge. From Kansas, Wisconsin and Minnesota, on the other hand, the reports of the wheat crops are most flattering.

THE address of F. B. Pierce, given in the list of patent claims in our issue of June 14, should have been Brockport, New York, instead of Brockport, Ill.

An Improved Pump.

The accompanying engravings illustrate the construction of a new pump, the invention of James Budd, of Sandy Hill, N. Y., which will draw water from either of two fountains or wells, or from both, and will discharge from either of two nozzles or from both, at the will of the operater; the adjustments to determine its action in any of these repects being very quickly and easily made.

Fig. 1 is a perspective view, and Figs. 2 and 3 are vertical sections at right angles with each other. In Fig. 2, only one induction pipe, F, is shown, and we will first describe the operation when drawing water through this pipe. A is the cylinder, and B the piston. The piston is of peculiar construction, being formed of two cup-shaped ends, *a a'*, connected by curved arms, *c c*, to a hollow cylinder, *d*, and each containing a ball-valve, E, fitted to close an opening, *b*.

It will be seen that as the piston rod is drawn outward from the cylinder in the direction indicated by arrow 1, the valve in the cup, *a*, is closed, while that in valve, a', is opened, forcing the water upward through the chambers, *h* and *e*, into the air chamber, I, while the return of the piston in the direction indicated by arrow 2 carries a current of water upward through chambers, *h'* and *e'*, also into the air chamber, I. Thus a constant flow of water into chamber I is maintained; the retaining valves, J and *g g*, preventing a reflux current downward.

From the chamber, I, the water passes by the pipe, K, into the chamber, L, whence it may flow through either or both of the vessels, M and M'; its course being determined by the position of the ball valve, N. This valve has two seats, *j* and *j'*, and when it is situated midway between them, as represented in the engraving, the passages to both nozzles are open, and the water is consequently discharged through them both; but if the valve is lowered upon the seat, *j'*, the passages to the nozzle, M, is closed, and the water can flow through the nozzle, M', only; while by raising the valve to the seat, *j'*, the passage to the nozzle, M', is closed, and the water is discharged through the nozzle, M, only. The stem, O, of the valve, N, passes through a stuffing box, P, and has a head upon its upper end by which the position of the valve may readily be changed at will. This is the explanation of the manner in which water may be drawn into the pump by one pipe, and discharged through either or both of two nozzles. The mode in which it may be drawn from one or both of two fountains, is shown in Fig. 3.

Fig. 1

BUDD'S TWO-STREAM PUMP.

The induction pipe, F, is curved forward and connected with a chamber, G, which has a retaining valve, G, fitted to close the passage to one of the two fountains. From the upper part of the chamber, G', is a passage leading to the pipe, Q, which enters the second of the two fountains. This passage has a valve seat, *k*, to which is fitted a valve, S, and it will be seen that when this valve is drawn upward to its seat, no water can pass into the pump through the pipe, Q, and it must consequently be drawn from that reservoir alone with which the lower pipe communicates. But if the valve, S, is carried downward till it rests upon the valve, G, so as to keep the latter valve closed, then must all of the water to supply the pump come through the pipe, Q.

The valve, S, has a stem, J, passing through a stuffing box, U, and provided with a nut, V, for raising and lowering the valve. The engraving represents pendant arms, *l*, working in a spiral groove, *m*, in the cup, W, for working the valve, but any other plan may be adopted if preferred.

This pump is designed especially for fire engines, but the inventor claims for it superiority as a farm pump or for manufactories.

The patent for this invention was granted through the Scientific American Patent Agency, April 29, 1862, and further information in relation to it may be obtained by addressing the inventor, at Sandy Hill, N. Y.

Fig. 2

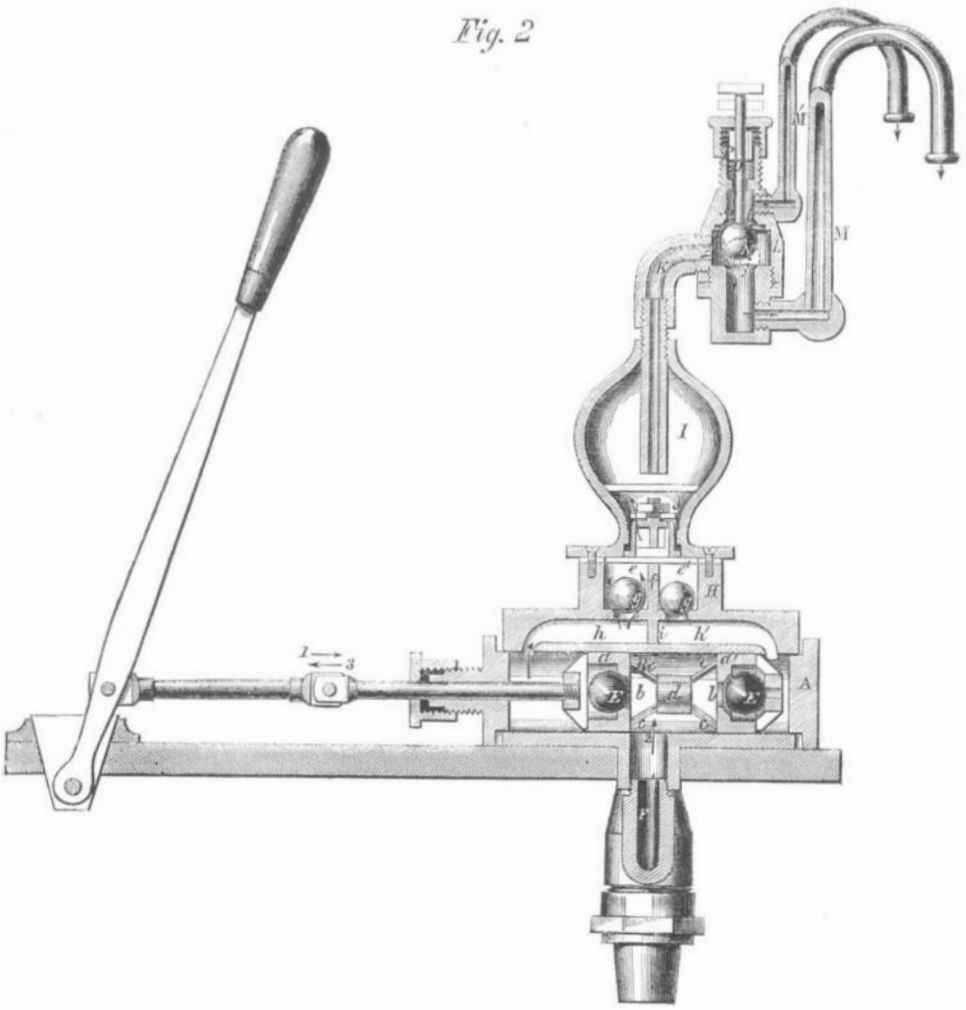
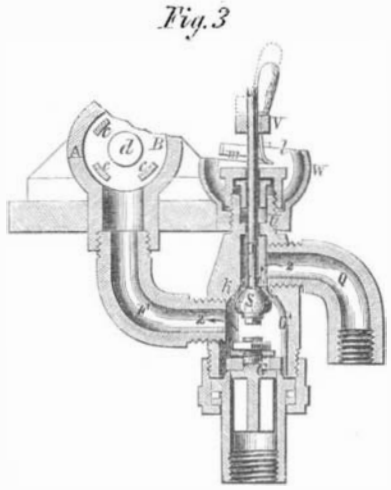


Fig. 3



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