

# Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

Vol. 3.

New York, February 19, 1848.

No. 22.

## THE SCIENTIFIC AMERICAN :

PUBLISHED WEEKLY  
At 129 Fulton Street, New York (Sun Building,) and  
13 Court Street, Boston, Mass.

By Munn & Company.

The Principal Office being at New York.

TERMS—\$2 a year—\$1 in advance, and  
the remainder in 6 months.

See advertisement on last page.

## Poetry.

### MY OWN DEAR NATIVE LAND.

BY SAMUEL D. PATTERSON.

I've wandered far in distant lands,  
Beyond old ocean's wave,  
And stranger hearts and kindly hands  
A generous welcome gave:  
I've stood among the high and great,  
In many a lofty hall,  
Where titled wealth and glittering state  
Held joyous carnival.

But, kind and generous and warm  
As were the hearts I met,  
Their welcome had no power to charm,  
Or lure me to forget  
My own loved land. The memory came  
In bower or stately dome,  
Across my soul, with magic gleam  
Of my own dear native home.

What, though its fields are wild and rude?  
Its mountains rough and high?  
And tempest floods in angry mood  
And turbulent rush by?  
It is the land of free-born men,  
Who spurn oppression's thrall,  
And every mountain pass and glen  
Echo to freedom's call.

No tyrant foe shall ever wave  
His conquering sceptre here;  
The heritage our fathers gave  
Their offspring hold too dear,  
With high resolve, and faith sincere  
A patriot host they stand,  
To guard the fame, unstained and clear,  
Of our loved native land.

### PROGRESS.

BY MISS PHEBE CAREY.

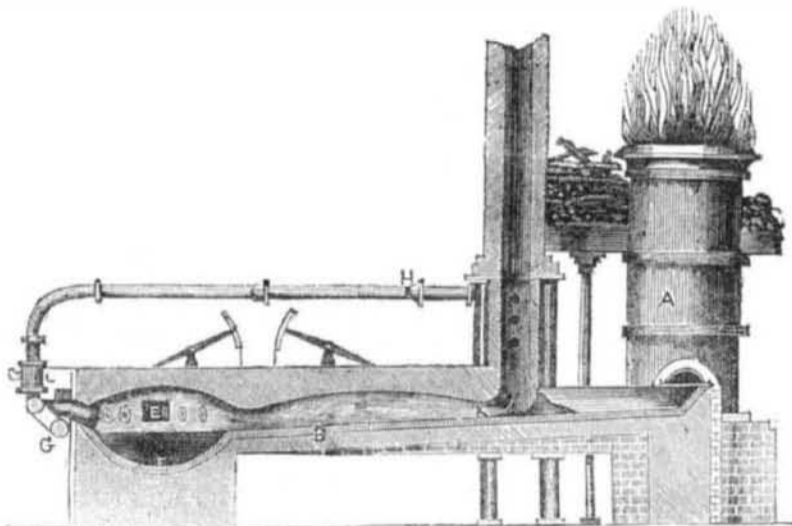
Does the earth contain one spirit  
Bowed despondent to the dust,  
On the midnight of whose vision  
Beams no star of hope and trust?  
Let that soul but pause and ponder  
On the works the Past has done,  
And an earnest, bright and glorious,  
For the Future shall be won.

For the soul must feel the stirring  
Of its destiny sublime,  
Who but rightly views the present,  
With its earnest heart and mind,  
Toiling in the earthly vineyard  
Many bands have found a place;  
Some are nearing to the summit,—  
Some are at the mountain's base.

Progress is the stirring watchword—  
Cheers them upward to the height;  
Canst thou pause and play the laggard,  
With its glories full in sight?  
And while fair and broad and glorious  
In our vision we can see,  
Still the future brightly stretching  
Into far infinity:

Who shall tell what bond or barrier  
To improvement heaven designed?  
Who shall dare to fix the limits,  
To the onward march of mind?  
Only He, who into being  
Called the unfathomed human soul,  
He for whom the hymn of Progress  
Through eternity shall roll!

## IMPROVEMENT IN THE MANUFACTURE OF CAST STEEL.—Figure 1.



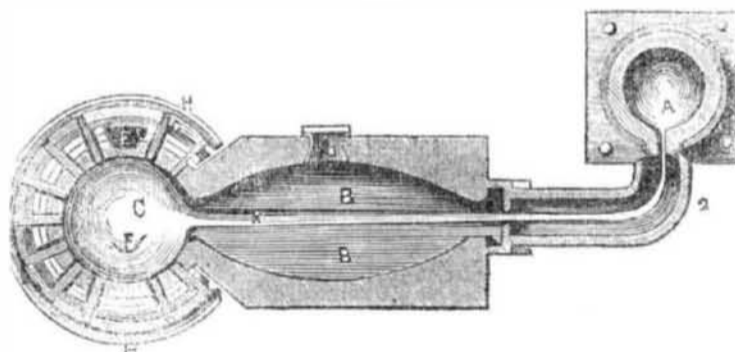
This is an invention of Mr. J. M. Heath, of London, iron manufacturer, for the manufacture of cast steel, by cast iron. The inventor uses the common cupola furnace heated with hot air. The fluid pig iron is run into a receptacle from the cupola, which receptacle must be able to stand an intense heat, in form like a common refinery. The quantity of fluid pig iron used should occupy about one-third of this vessel and be kept intensely hot by currents of ignited carbonic oxide gas conveyed through pipes to bear upon its surface, or oxyhydrogen gas, produced by directing a stream of atmospheric air into a current of hydrogen gas formed from the decomposition of water which is allowed to trickle upon

malleable iron brought to a high heat. When the cast metal is rightly decarburated, which requires some practice to know, about an equal proportion of malleable is introduced to the fluid pig iron. If grey pig iron is used, it will require more malleable mixed with it than if the white was used.

The malleable iron is mixed in the pig iron fluid in scraps and must be heated to a white heat first in another furnace, and when it is put into the receptacle with the pig iron, it is raked and stirred about sufficient to produce an intimate mixture.

The description of the two cuts is blended, for a better explanation, because Fig. 1 is a section taken in the line 1, 2, of

Figure 2.



And Fig. 2, is a sectional plan view of the furnace, the upper part being removed to show the interior. A, is the cupola in which the pig iron is melted. There is nothing peculiar in the form or size of this furnace; but the patentee prefers the use of heated air, to preserve the metal, while running from the furnace, at the highest possible temperature. B, is the bed between the receptacle for the fluid metal and the chimney. The malleable iron, or deoxidated iron, is placed upon this bed, on either side of a channel K; and it is brought to the highest possible temperature, by the passage over it of the flame from the combustion of the gas and air introduced through the pipes G and H. C, is a receptacle, into which the melted pig iron is run from the cupola, and into which the malleable iron, at a white heat, is raked through the door D, when at a high heat, and intimately mixed with the fluid pig iron, by stirring with a wooden pole; the temperature of the contents of the receptacle may be raised to any degree required, by means of the combustion of any gas, rich in carbon and hydrogen, by mixing with it hot atmospheric air, or oxygen

gas, as before mentioned; and the proportions required to produce perfect combustion of the gas, without producing an oxidating flame, may be exactly regulated by a stop-cock, or valve L, placed on the pipe H. The receptacle may be of any size, according to the quantity of steel required to be produced.—Carbonic oxide is the best gas for this purpose which may be collected from a cupola or a blast furnace, or may be produced in a separate furnace, by the combustion of any refuse fuel. D, is the door by which the malleable iron or deoxidated ore is introduced upon the bed B, and by which it is raked into the receptacle. E, is a small door through which a bar of iron or a wooden pole is introduced, for the purpose of stirring the melted fluid. F, is a tap hole, by which the steel is run into moulds from the receptacle. G, are pipes, through which the carbonic oxide or other gas is conveyed to the receptacle C. These pipes should dip downwards slightly, so that the flame from the ignited gas may play upon the contents of the receptacle, and keep the whole in a fluid state. H, are pipes, through which the hot atmospheric air, or oxygen gas, is con-

veyed, to be mixed with the gas in the pipes G. When atmospheric air is used, it may be heated in the pipes by the waste flame which passes up the chimney. The gas and air pipes are arranged in the usual manner.—The channel through which the liquid pig iron is run from the cupola or blast furnace into the receptacle is shown at K; and L, is a valve by which the admission of hot atmospheric air or oxygen gas is regulated, so as to produce perfect combustion. When the assays taken from it shew that the steel of the receptacle is of the desired quality, the contents are run off into moulds.

We are acquainted with an iron manufacturer in New Jersey who has invented a more simple plan to effect the same object as Mr. Heath's invention. We will be able to give an engraving of it as soon as it has progressed far enough to warrant a prudent publication.

### RAIL ROAD NEWS.

#### New York and Erie Railroad.

Thirteen miles of the New York and Erie Railroad have been completed since the annual report, from Shawongunk summit to Port Jervis, on the Delaware making in all 75 miles now in running order. The adoption of the Delaware river route has enabled the Company to obtain a line descending on a grade from the mountain of only 45 feet to the mile. The section from Port Jervis to Binghamton, 127 miles, is under contract and the work is in such a state of forwardness that its completion is anticipated in the Fall of the present year. With that expectation contracts have been made for 21 locomotives of the largest class, and provisions have been made for a sufficient outfit of freight and passenger cars, most of which will be built in the shops of the Company. A large portion of the iron rails are now upon the road, and the work of laying down the track in the valleys of the Delaware and Susquehanna will be commenced about the first of June next. A considerable force has been employed in grading the Newburg branch.

The receipts of the Company from all sources during the year was \$2,306,789 39 and expenditures for all purposes including construction, \$2,379,446 81. The cash on hand January 1, 1848, was \$170,441 88—Number of miles in operation, (not including extension to Port Jervis,) 62.

#### Hudson River Railroad.

The Engineer of the Hudson River Railroad (J. B. Jervis Esq.,) has made his report on locating the line between Fishkill and Albany, giving it as his decided opinion that the best interests of the stockholders and the public require that the River route should be taken. It appears from the report that the advantages of the River route are numerous, while those of the inner are few and insignificant. The estimate of the first cost of the inner route is \$538,669 less than the River route. The two lines are about the same in length, being about one mile in favor of the inner route. The total ascent and descent on the River route is 152½ feet. The total ascent and descent on the inner route is 1,061.58 feet! Estimated yearly expense of overcoming the high grade of the inner route over the River route, after deducting some extra charge which the River route would be subject to, \$42,000—equal to an investment of \$600,000 at 7 per cent.

#### Mobile and Ohio Rail Road.

A railroad from Mobile, Ala., to the mouth of the Ohio river, has been in contemplation for a year or two past, and a charter for it has now passed the Alabama Legislature, 78 to 13. It is an immense undertaking, and though it would be exceedingly profitable if the countries through which it has to pass were thickly settled, it can be scarcely sustained while the country is filling up.