

It is quite evident that further improvements can be made in this oven, especially in reducing the present heavy manual labor of drawing its charge of coke. It requires about three hours of hard work to do this, and the only compensating element in this expenditure of labor is in the fact of the coke being watered out in the oven and affording, as it is drawn out, a bright dry fuel; but it appears reasonable that some mechanical appliance can be introduced to this form of oven to discharge its coke more rapidly and at less expenditure of the men's labor.

The Adams coke oven, with its moveable bottom, which enables the operator to discharge the coke in from 10 to 20 minutes by mechanical means. An improvement of this kind is very much needed and should commend itself to those building new plants of ovens.

The following specifications will exhibit the important requirements in constructing the bee-hive ovens in a permanent manner.

SPECIFICATIONS.

Foundations.—The foundations for the masonry work shall be excavated to such a depth as may be required to give it a permanent seat and assure stable work.

Masonry and Retaining Walls.—The masonry of the retaining walls of the bee-hive coke oven shall be built of sound sandstone in plates not exceeding six inches in thickness, well bonded. The first two feet of the foundation shall be laid dry, with large flat stones, carefully bedded, so as to afford the most permanent foundation. Above this the masonry shall be laid in lime mortar, composed of good lime and sand, in such proportions as may be directed, to be well and thoroughly mixed so as to insure thorough blending of the materials. The face of the wall shall be carried up with a uniform batter, as shown in the drawing, and have a workmanlike finish. The seats for the oven doors to be of selected and dressed stones, having their upper surfaces neatly bedded to receive the cast iron door frame.

Filling Under Ovens.—The filling under oven seats to be made in layers not exceeding one foot each in depth of earth materials, free from vegetable matter. It is to be wet and packed in a solid manner by rammers or rollers, so as to insure a permanent foundation for the ovens without shrinking or settling. The materials used for this purpose to be procured from such points as may be indicated by the engineer or person in charge of the work.

Building the Coke Ovens.—The coke ovens shall be built in accordance with the plans hereby annexed. They shall be founded on a circular base, or on a ring crossed by circular stone flags. The first section of the oven shall be circular, 12 feet in diameter, built with fire brick shaped for this special purpose, and lined in a true circle by a sweep pivoted on the center of the oven. The dome is to be built with appropriate brick by the sweep or on centers, as the engineer may direct. The whole to be keyed by the charge port ring on the crown of the oven. The door jambs and the arch brick are to be neat and carefully laid, so as to make strong work and good bond. The mortar to be used in the ovens to be composed of loam, or with loam and such mixture of clay as the engineer may approve. The tiles on floor of oven are to be laid in 12-inch layers, to be compacted with rammers, or in such a manner as will make solid work that will not settle so as to injure the oven. The filling on top of ovens to be carefully made and compacted as the engineer may instruct. The packing from the springing of arch to the top of oven to receive special care in compacting it, so as to insure the utmost stability to the ovens.

Filling the Wharves.—The wharves are to be constructed of such width as may be found most desirable; usually from 20 to 30 feet. The wharf retaining wall to be made of stones well bedded, with a slide batter, and of such height as to insure the most economical means of loading the coke into railroad cars. The pipes for conveying water to the ovens are to be placed at such depth under the surface of the wharf as to prevent any freezing during the winter season. The tracks for the larry on top should be laid with iron ties as shown in the drawing. The grade of the ovens to descend with the tonnage, so that the loaded larry will gravitate down the line of ovens. Usually one foot fall to the 100 feet long will assure this result.

The following estimate of materials for a bee-hive oven 12x7 feet will be found approximately correct: 1,250

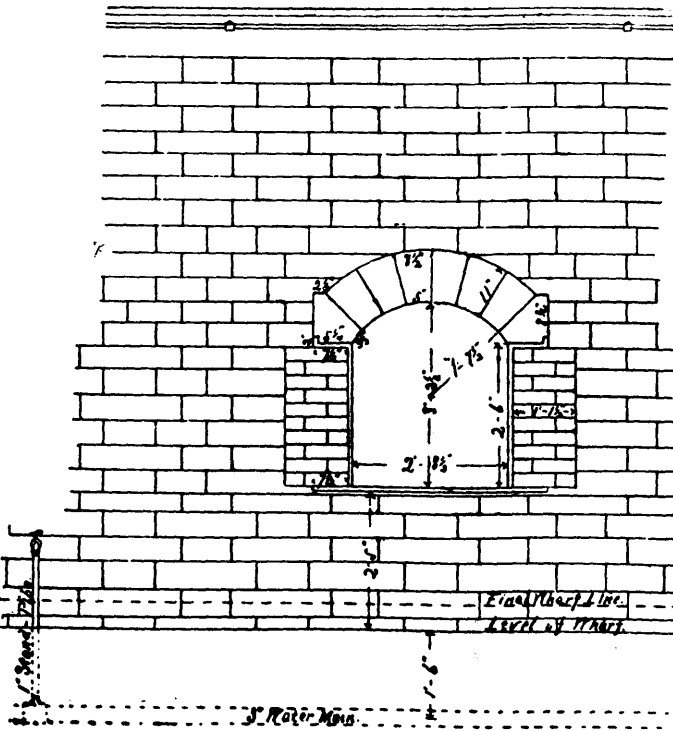


Fig. 2

lining brick, 400 skew brick, 2,000 crown brick, 130 tiles, 1 set of jambs, 1 arch, 1 port ring.

All fire-brick makers understand the quality of the brick and their shape, so as to meet the want of builders.

Chemical and Physical Properties of Connellsville Coke.

	Dry.	Wet.
Grammes in one cubic inch..	15.47	23.67
Pounds in one cubic foot.....	58.98	87.34
	Coke.	Cells.
Percentage by volume.....	49.96	50.04
Compressive strength per cubic inch (3/4) ultimate strength....		302
Height of furnace charge, supported without crushing.....		120
Order in cellular space.....		1
Hardness.....		3.5
Specific gravity.....		1.89

Chemical Analysis.

Fixed carbon.....	87.46
Moisture.....	0.49
Ash.....	11.32
Sulphur.....	0.69
Phosphorus.....	0.029
Volatile matter.....	.011

NOTE.—Reprinted by kind permission of the Am. Manfr. and Iron World.

A Coal Combination.—Her Majesty's Secretary of Legation at Washington has prepared a long report in the course of which he states that there was a case in Pennsylvania of a combination of coal companies—five of these companies doing business in that State and controlling a certain kind of coal—combined by means of an agreement that all sales should be made through a committee and one selling agent, and that prices should be fixed in the same way. After a time a quarrel arose between two of the companies, concerning a division of the profits, or of the fines imposed for sales, in excess of an allotment designed to limit production. One of these companies sued the other to recover its share of the sum so assessed. The Supreme Court of Pennsylvania held that the combination was illegal and void, and for that reason refused to aid the plaintiff. The Court went further. The mines of the company were in Pennsylvania, but the combination was completed and the purpose of it accomplished in the State of New York. The Court declared that the combination was not only illegal, but also that under the laws of New York it was a conspiracy, or as the judge said when referring to the case in the Sugar Trust decision, "a criminal offence." The fear is generally increasing that this control of respective industries "by trusts" will encourage the formation of others, and, in the end, that complete monopolies will be established over every necessary of life. Whether these apprehensions are well founded or not is a question which it has been as yet impossible to decide. The gravest evils laid to the charge of trusts are (1) the suppression of competition, (2) the exclusive power of regulating the prices of production and manufacture, thereby bringing the public at each end of the industry under their complete control. It is held that these trusts are the most dangerous to the public good by being the most guilty of the above charges, which owe their success in accumulating capital, and in beating down competition not possessed of power enough to withstand that accumulated capital, to persistent discrimination of the railroads in their favor.

LETTERS TO THE EDITOR.

Idle Mines in the State of New York.

KINGSTON, 25th August, 1890.

SIR,—A recent bulletin of the New York State Museum reports 30 mines of magnetic iron ore, 8 of hematite ore, 11 of bog ore and 3 of fossil ore, lying idle in that State. The output of iron ore in 1880 was 1,262,000 tons; in '88 only 4,000 tons more. There are in the same State, as we learn from another source, 14 anthracite, 1 coke and 8 charcoal furnaces out of blast. There is food for speculation in these figures which may amuse or edify those who trace our industrial inactivity in mining affairs to the American tariff.

Yours, etc., B. J.

Phosphate Shipments.

The ocean shipments from the Port of Montreal since our last issue to date are reported as follows:—

Date.	Name of Ship.	Destination.	Shippers.	Quantity.
July 30	SS Dominion.....	Liverpool	Lomer, Rohr & Co.	250
Aug. 6	Ripon City.....	Hull.....	do	300
" 7	Mondego.....	London..	do	700
" 9	Soudan.....	Liverpool	Wilson & Green...	253
" 14	Grona.....	London..	Lomer, Rohr & Co.	55
" 14	Toronto.....	Liverpool	do	150
" 15	Grinum.....	H'mburg	Millar & Co.....	300
" 18	Sarnia.....	Liverpool	Lomer, Rohr & Co.	150
" 18	Catalan.....	do	Wilson & Green...	306
" 20	Ocean King.....	London..	Lomer, Rohr & Co.	90
" 23	Oregon.....	Liverpool	do	150
				2704

SHIPPER'S RECAPITULATION.

	Tons.	Bags.	Tons.	Bags.
Lomer, Rohr & Co., (to 19th June) ..	2,715	100		
do (to 23rd July).....	1,830	100		
do (to 23rd Aug.).....	1,845	..		
Millar & Co. (to 18th June).....	1,475			
do (to 15th July).....	1,540			
do (to 23rd Aug.).....	300			
Wilson & Green (to 16th June).....	823			
do (to 22nd July).....	2,132			
do (to 23rd Aug.).....	559			
Total European shipments to date.....	13,219	200		

RECAPITULATION OF EXPORTS.

	Tons.	Bags.	Tons.	Bags.
Liverpool, previously reported.....	5,816	100		
do reported to 23rd Aug.....	1,259			
Reported to date.....			7,075	100
London, previously reported.....	2,145			
do reported to 23rd Aug.....	845			
Reported to date.....			2,990	
Hamburg, previously reported.....	1,284			
do reported to 23rd Aug.....	300			
Reported to date.....			1,584	
Glasgow, previously reported.....	1,170	100		
Swansea, do.....	130			
Hull, do.....	300			
Total exports to Europe since opening of navigation.....	13,219	200		

The Progress of Canadian Railways.—There are in the Dominion of Canada 13,325 miles of completed railways and 416 miles under construction, representing a paid-up capital of £152,115,289. In 1889 the working expenses were £6,207,609, and the earnings £8,429,923, leaving a net income of £2,222,314. Over the 12,628 miles in active operation last year, 12,154,051 passengers were carried, and 17,923,626 tons of freight. During the past ten years the mileage of railways in the Dominion has more than doubled, while forty-six years ago there were only 16 miles of railway in operation over the whole of British North America. It is calculated that there is now one mile of railway to every 375 inhabitants.