

IRON AND STEEL.

What is known as the Bessemer process, for the conversion of pig-iron into steel, has worked a complete revolution in manufactures by reducing the cost of making steel at least \$100 per ton, thus leading to its substitution for iron in engine work, bridges, plating of ships, and for railway purposes. One firm in Liverpool has already constructed 30,000 tons of shipping wholly or partially of Bessemer steel; and it is being extensively used in Europe and in this country for rail roads, on account of its durability, it having been proved by experiment that one steel rail will stand the wear and tear of seventeen of the best iron ones. To supply the increased demand the works in Great Britain now produce more than 6,000 tons weekly, or fifteen times the entire production of cast steel in that country before the introduction of the Bessemer plan.

For the information of our readers we propose to say a word or two as to the process which has produced such grand results. Under the common name of iron there are virtually three metals, which differ from each other even more than many chemically distinct metals, the difference resulting from the influence of carbon in causing a variation in the physical properties of the metal. Thus, when carbon is absent, (or present only in small quantity) we have wrought iron, soft, ductile, and not susceptible of tempering. When carbon is present in certain proportions we have various kinds of steel. Increase these proportions of carbon to a certain extent, and the result is cast-iron; hard, brittle, and not forgable or weldable. This being so, it will readily be perceived that steel may be made either from wrought iron, by the addition of carbon; from cast-iron by its decarburization, or by the addition of malleable to cast-iron in the proper proportion. Of the methods of adding carbon to malleable iron to produce steel, there are many. One of the oldest, and that most commonly employed, is the exposure of straight, flat bars of iron (in contact with ground charcoal, under a covering impervious to air,) to the action of a glowing red heat for from 7 to 10 days, the resulting metal being known as "blister steel." To get rid of the surplus carbon in cast-iron, and reduce it to the proportion in which it exists in steel, various methods have been in use which it is necessary to refer to here.

We, therefore, pass directly to the Bessemer process, which is merely the decarburizing of pig iron, while in the molten state, by blowing atmospheric air through it, thus producing steel; a process accidentally discovered, and which, like other great discoveries, is so simple that the wonder is it was not thought of before. Bessemer, about the time cast iron cannon were falling into disfavor, made a series of experiments, one of which was that of purifying the iron to an unusual extent by blowing air through melted pig iron. His first experiment was rather alarming, and nearly led to a disastrous fire. The only other result was "burnt iron." His second trial was a little more successful, and the product was malleable iron. It now struck him that by stopping the decarburization before it was complete steel would be produced. He tried again and the result was unmistakable steel. Not meeting with much encouragement from the iron and steel makers, Mr. Bessemer started works of his own, and the certainty, celerity and cheapness of his process soon led to its universal adoption, with the results already stated. —[*Dollar Star*.]

A NEW ENTERPRISE.—A club of energetic young men in New York have organized a company for the negotiation of marriages, and keep a book in which is recorded a list of desirable matches, in this style:

First Class.—Sarah Jones, aged 17 years; orphan and heiress; portion, \$190,000. Guardian Peter Smith, flour merchant. Residence No. — Fifth avenue.

Second Class.—Maggie Peters, half orphan, father died rich; mother and one brother living; age 19; portion, \$60,000; residence No. — Fifth avenue.

Third Class.—Elizabeth Van Bruen, age about 18; father and mother living; two brothers and one sister living; old gentleman good natured, and worth \$9,000.

Fourth Class.—Josephine Levantour, aged 20; father and mother, one brother and sister living; father doing good business as a broker in Wall-street, and like to leave a respectable fortune to the children; residence No. — West Thirty-fourth street.

EXPERIMENTS WITH THE NEW KIND OF GUNPOWDER.—We stated about a week ago that a series of experiments were to be performed to test the quality of Gustave Neumeyer's new gunpowder. The property of this new gunpowder consists in its not exploding unless subjected to a strong pressure. Its ingredients are the same as those of the common sort, but the proportions are probably different; a circumstance which, of course, is the inventor's secret. M. Neumeyer makes four kinds of gunpowder, namely, one for ordinance, another for muskets, a third for fowling pieces, and a fourth for mining purposes. The three first are granulated, but the fourth is a very fine powder. A certain quantity of the other sorts was set fire to in the open air; it burnt away with a fizzing noise like that of sulphuric acid dropped on a brick; it emitted a smell of sulphur. Eleven kilogrammes of the compound were introduced into three small wooden barrels, which were then carried with their bungholes left open into a small house built of stone and roofed with tiles. The door was locked and a train fired. A thick smoke first issued from the chimney, and was followed by flames; no real explosion took place, but after a few seconds the roof was thrown down, together with part of one of the walls, whilst the three barrels, though somewhat injured, were found entire; so that the above-mentioned effect must be attributed merely to the pressure occasioned by the heat and the gas. In another series of experiments, a cartridge containing thirty-eight designs of gunpowder was introduced into a Prussian needle-gun. At a distance of 150 metres, the olive shaped bullet went through a target composed of a piece of oak between to pieces of fir, forming an aggregate thickness of about a foot. The same quantity of gunpowder introduced into the gun without being rammed, simply fizzed and did not expulse the bullet. We understand that these experiments are to be continued. —[*Galignani*.]

A NOVEL VEHICLE.—The Jackson (Mich.) *Citizen* has the following:

Isaac Tucker, a very poor cripple, five years since procured a couple of puppies of a cross between a hound and a bull dog, and as they grew up he harnessed them and trained them to draw a small four-wheeled cart. After they had got their strength, Tucker mounted a small dry-goods box on the cart for a seat, and seating himself upon it he began travelling over the country, soliciting pecuniary assistance from the less unfortunate. Two months ago Tucker started with his "team" from Genesee County, Mich., and has during that time traveled in a roundabout way over three hundred miles. The least distance traveled in one day was four miles, and the greatest twelve miles. Unlike most dogs when constrained or put to labor, they are not ferocious, except when their master is interfered with. Tucker drives them as a farmer does a pair of oxen, with a long stick. They understand the terms used to oxen to make them turn to the right or left, and appear to be very well behaved dogs. He was in the city with his novel team this morning.

KIDNAPPING IN CHINA.—A letter from Pekin, in the *Paris Moniteur* contains the following:

Crimes have never been more frequent in the capital, and assaults on private persons have assumed a most frightful character. Pekin is at this moment infected by a band of malefactors, who carry off children and young women. The Chinese relate that the bandits, to effect their object more easily, use a stupefying powder, by means of which they send their victims to sleep. They afterwards transport them beyond the walls of Pekin to haunts unknown to the police, and put them to death if they cannot obtain heavy ransoms from their families. These facts have occurred often enough to spread terror among all classes of the population; and the court, report says, is much preoccupied with the subject. The superior magistrate, Toen-kuo, has recently made a report to the sovereign, in which he demands that the crime of abduction should be assimilated to that of robbery with violence, and punished in the same manner.

SWITZERLAND ARMING.—The Swiss Government has applied to the Prussian Government for permission to send two officers to learn from the Prussian army the drills and exercises there used. This request, which has been acceded to, has been made because Switzerland is about to arm, not a standing army, but probably the whole of her male inhabitants between 15 and 60 years of age, with breach-loading arms.

ABSTRACT

Of Meteorological Observations for the month of October, at G. S. L. City.

THERMOMETER OPEN AIR:

Highest 82° | Lowest 40° | Mean 63°

The amount of rain and snow water measured 1.800, which is one and three fourth inches of water over the surface and 50-100 over.

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- 1 A.M. cloudy; p.m. clear
- 2 Clear
- 3 do
- 4 do
- 5 A.M. clear; p.m. hazy and cloudy; high wind S.
- 6 Clear and windy
- 7 Clear
- 8 do
- 9 do
- 10 do
- 11 do
- 12 Partially clear, rained at night
- 13 Rainy-day
- 14 Cloudy; snowed 1 inch
- 15 Cloudy and cool
- 16 Cloudy and snowy
- 17 Cloudy
- 18 A.M. rainy; p.m. clear and cloudy
- 19 Cloudy and rainy; snowed at night
- 20 Cloudy and snowy
- 21 Cloudy
- 22 Hazy and clear
- 23 do do
- 24 do do
- 25 Clear
- 26 Cloudy and windy
- 27 do do
- 28 Mostly cloudy
- 29 Clear
- 30 do
- 31 do

W. W. PHELPS,
Meteorological Observer.

VENETIAN HOUSES.—The sociability of Europe, and more especially of southern Europe, is shown abroad; under the domestic roof it dwindles and disappears. And indeed it is no wonder, considering how dispiriting and comfortless most of the houses are. The lower windows are heavily barred with iron; the wood-work is rude, even in most palaces in Venice; the rest is stone and stucco; the walls are not often papered, though they are sometimes painted; the most pleasing features of the interior is the frescoed ceiling of the better rooms. The windows shut imperfectly, the heavy wooden blinds imperiously (it is worth while to observe that there are no Venetian blinds in Venice?); the doors lifting slantingly from the floor, in which their lower hinges are imbedded; the stoves are of plaster, and consume fuel without return of heat; the balconies alone are always charming, whether they hang high over the streets, or look out upon the canals and with the gaily painted ceilings, go far to make Venetian houses habitable. —[*Venetian Life*, by W. D. Howells.]

ECONOMY OF HEAT AND CONSUMPTION OF SMOKE.—Among recent and valuable inventions is the furnace of Mr. Liemens of England, which has excited great interest in Great Britain, where the presumed dearth of mineral fuel has been regarded with apprehension. This invention, however, lays all such apprehensions at rest, for it literally economizes all the fuel and all the heat, and gives no smoke. It has a gas-producer, standing apart, in which the coal approaches the fireplace by an inclined plane, where it is heated gradually and parts with all its volatile products, which pass through the fire.

The fuel itself is slowly consumed; the carbonic acid, an incombustible gas, is converted into combustible carbonic oxide by passing through the thick layer of red-hot coal. Then below the grate a cistern of water gives off steam, and each cubic foot of this steam, as it rises and passes through the fire, is decomposed into double that quantity of hydrogen and carbonic oxide, which being inflammable, increases the temperature. The whole of the heat products travel through the furnace and enter one of four chambers, or regenerators, as Mr. Liemens calls them, which are built in the lower part of the structure. These four are used alternately; while one heats another cools, and the reverse. They intercept the heat, which otherwise would fly from the chimney in waste; and after passing through the gas and air reach the heating chamber itself; a heat so intense that, unless modified, it would fuse the furnace and everything exposed to its action. No smoke escapes; the heat in the chimney is seldom sufficient to singe wool; and the saving of fuel compared with an ordinary furnace is from forty to fifty per cent.

For glass houses, steel smelters, manufacturers of iron, and any trade or process in which intense heat is required, the Liemens furnace is essentially suitable. As it economizes all the heat derivable from the combustion of the fuel—fifty or sixty per cent. of which is now lost, it is not likely to be superseded in our day. The yearly saving by means of this furnace is far more than its cost.

Fresh Arrival!

Two Mule Trains

FROM THE

MISSOURI RIVER THIS SEASON.

STAPLE DRY GOODS:

Domestics,	Delaines,
Denims,	Checks,
Hickory,	Cottonades,
	Prints.

FANCY DRY GOODS:

BONNETS,	FLOWERS,
HATS,	RUCHES,
DERBYS,	FEATHERS,
PARASOLS,	RIBBONS.

WOOLEN GOODS:

General Assortment of Summer
Woolens.

CLOTHING:

DUSTERS, FLANNEL SUITS, Etc.

MILITARY GOODS:

Shoulder Straps,
Buttons,
Cord, &c.

All will be Sold LOW for

CASH!!

CLORDGE & CLAWSON.