

Scientific American.

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

VOL. XIV.

NEW YORK, DECEMBER 4, 1858.

NO. 13.

THE SCIENTIFIC AMERICAN,

PUBLISHED WEEKLY

At No. 128 Fulton street, (Sun Buildings), New York.

BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns of the United States.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in this city Brooklyn and Jersey City.

Sampson Low, Son & Co., the American Booksellers, 47 Ludgate Hill, London, Eng., are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months. See Prospectus on last page. No Traveling Agents employed.

Steel Castings.

A method has recently been devised by which wrought iron can be melted, and poured into molds, producing castings which retain all the toughness and qualities belonging to wrought iron. Scrap or wrought iron may be employed, or bars or plates cut into small pieces, these being melted in crucibles such as are used for melting blistered steel. To a charge suitable in amount to the crucible, one-half of one per cent. of charcoal, (by weight,) one per cent. of manganese, and one of red ammonia are added. The whole is covered from the atmosphere and melted in a temperature of about fifteen hundred degrees Fahrenheit, which temperature is maintained for three hours. The metal is then poured into molds. The iron thus cast is so malleable as to be capable of being treated under the hammer in the forge, and thus part of the iron may be shaped in molds and part completed by forging, producing wrought work.

[The above is copied from an exchange, and we consider it a good recipe for converting wrought iron into cast steel. Any one who may try the experiment will find it to produce a good result. Let them smelt all the given ingredients in a crucible, skim off the scoria, and pour out the metal into ingot molds, and they will find very good cast steel.]

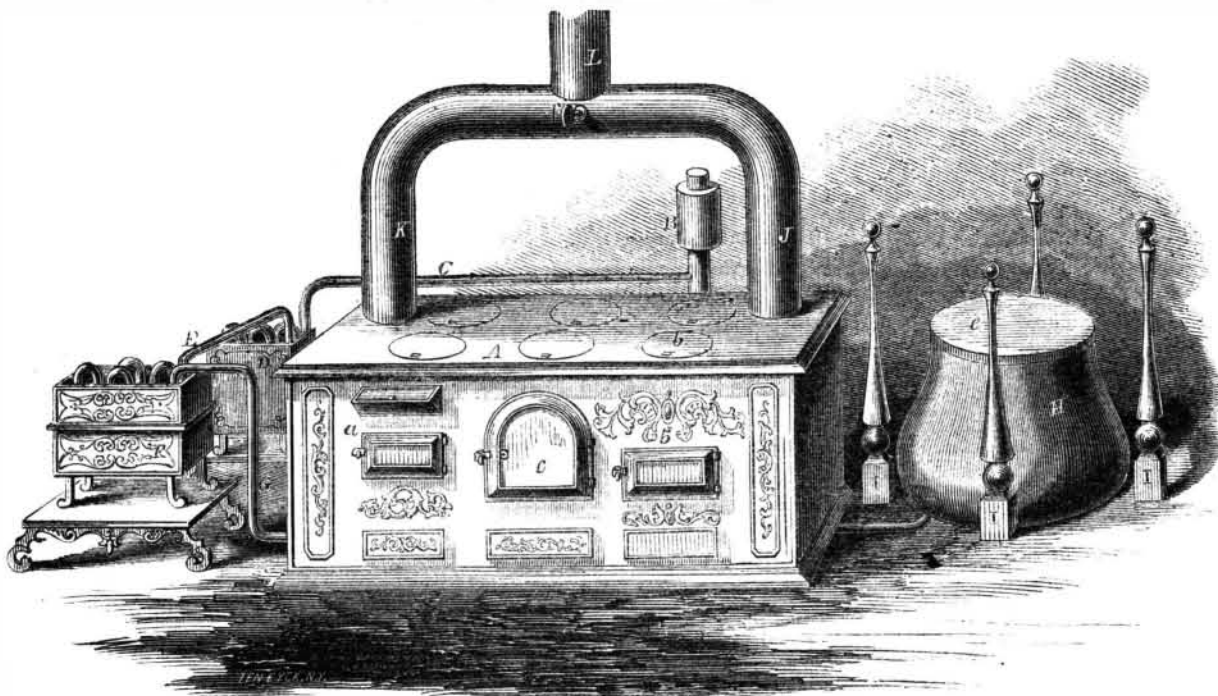
Russia Sheet Iron.

It is a popular notion that the process of manufacturing the tenacious and glossy "Russia sheet iron" is a profound secret and that the vigilance of the Russian government and the Russian manufacturers has hitherto successfully prevented all foreigners from obtaining the slightest information on the subject. The present Commissioner of Patents, in his last report, also alludes to the manufacture of this article as one of the great unsolved problems in science, which the industrial interests of the country require should be explained.

Mr. Wells, in his recent work, "Principles and Applications of Chemistry," states that this current belief has no foundation in fact, and that the method of preparing the iron in question is perfectly well known. According to the authority quoted, "Russia sheet iron is, in the first instance, a very pure article rendered exceedingly tough and flexible by refining and annealing. Its bright, glossy surface is partially a silicate, and partially oxyd of iron, and is produced by passing the hot sheet, moistened with a solution of wood-ashes, through polished steel rollers."

Another mythical bubble is thus punctured, and the wonderful story of guarded founderies and ever-watchful officials, as connected with Russia sheet iron, will take rank with the account of "Symmes Hole," and the barnacles which turn to Solon geese.—*Exchange.*

HENDRICKX'S GAS APPARATUS.



There is little doubt that gas, as supplied to consumers in our large cities in charged a most unwarrantable and extravagant price, and very often the quality is not the best. Many methods have been adopted to lower this price, but in most instances have proved unsuccessful, and the only way now left is for such as have large houses, hotels, public buildings, &c., to make their own gas, and prove to the gas companies their independence. In the country, where no gas-works are erected, the ever-dangerous "burning fluid" is used as an illuminating material, and the results, in the form of accidents and loss of life, we read in every newspaper. The most safe, cleanly, and cheap illuminating agent has been unquestionably proved to be coal or other gas, the former being most easily manufactured, and the raw material generally at hand. Many individuals would willingly fit up a private gas-works, but they have not, in the first instance, the room to spare in their garden or grounds, and secondly, few feel inclined to go to the expense of putting up gas-works for their own private use.

In order to enable every family to make their own gas, A. Hendrickx, of this city, has invented the arrangement that forms the subject of our illustration. It is a combination of a cooking range and a gas apparatus, so that the waste heat from the range can be made to aid in the generation of gas, and the coke produced in the retort will, in a great measure, supply the fuel for cooking. The perspective view of the apparatus above may be easily understood.

A is a cooking range, having on its top plate the openings, *b*, for pots and pans, an oven, *c*, and fire door, *a*. This cooking fire is connected by a flue, *K*, with the chimney, *L*, so that it is perfectly independent of the retort, and can be used alone when it is not requisite to make gas, the retort being placed through the back of the range on the opposite side of the oven, and its fire door is seen at *b'*. The flue of the retort fire is indicated by *J*, and communication can be opened between it and *L* by the damper, *f*, which enables only one or both fires to be lighted and used.

As it is supposed that this apparatus will

have to be attended to by domestics who are not used to manage such contrivances, it has been made as simple as possible; and in the pipe which conducts the gas from the retort to the condensers there is a safety valve, *B*, (on which there is a special patent) the use of which renders explosion almost impossible; and no matter how careless the attendant may be, the retort being once filled with coal, the door closed, and the fire attended to, the apparatus will continue to work with safety and perfection as long as there is any gas in the coal, as, should the gas be generated so quickly as to produce a dangerous pressure in the retort, it will elevate the safety valve—which is simply an inverted cup over a pipe, and surrounded by water—and pass quietly into the air, without any dangerous results. The gas passes from the retort through pipe, *C*, into the condenser and cooler, *D*, where it parts with its tarry matters and other impurities, and from that it passes by pipe, *E*, into another purifier, where the sulphur is separated, and the gas thoroughly cleansed by a special composition adapted to this apparatus. This gas is finally led through pipe, *G*, into the gasometer, *H*, placed between the posts, *I*, which is an india rubber bag of any suitable size, and which is provided with a flat top, *e*, that can be weighted to force the gas to the burners with any desired pressure.

We have seen one of these combination cooking ranges and gas generators at work, and were highly pleased at its economic results. It is free from the many objections which are raised against rosin and rosin oil apparatus, and it is every way adapted to supply large or small houses with that most necessary of all blessings—light.

The patents are dated April 27th, July 27th, and August 3d, 1858. Any further information as to cost, agencies, &c., can be obtained by addressing Hendrickx Brothers, Gas Generating and Cooking Range Co., No. 512 Broadway, New York.

Animal Curiosities.

The tongue of a cat is a singular instrument. It is her currycomb. For this purpose it is rough, as you will find it if you feel it. When she cleans herself so industriously, she

gets off the dirt and smooths her coat just as the ostler cleans and smooths the horse's coat with the currycomb. Her head she cannot get at with her tongue, and so she has to make her fore-paws answer the purpose instead.

There is one bird that lives chiefly on oysters. It has a bill, therefore, with which it opens an oyster as skillfully as an oysterman can with his oyster knife.

Some birds can sew very well with their bills and feet. There is one bird that sews so well that it is called the tailor bird. Its nest is hid in leaves which it sews together. It does this with a thread which it makes itself. It gets cotton from the cotton plant, and with its long, delicate bill and little feet, spins it into a fine thread. It then pierces the holes through the leaves with its bill, and passing the thread through the holes, sews them together. We believe that in getting the thread through the holes, it uses both its bill and feet.

Novel Experiment in Ship Building.

The Boston Journal describes a steamer which is now being built at East Boston, and is to be propelled in a novel manner. She is built as an experiment, the inventor being furnished with the necessary funds by some of the leading shipbuilders of Boston. The hull is fifty-two feet long, and thirteen feet wide at the stern, and tapers gradually at the bow, which is very sharp. She is five feet deep. On deck she will have a cabin 19 feet long. She will be worked by an engine of 12-horse power, to which will be attached two propellers—one at the stern, three feet in diameter, to work in the water, and one at the stem, eight feet in diameter, to work in the air. The air propeller is attached to a shaft which connects with the engine and the water propeller at the stern. It is supported by a post at the stem. Both propellers will be worked by steam. The smoke pipe will lie horizontally on the deck. The inventor is confident that by this arrangement he can easily get 25 to 30 miles an hour speed out of this craft.

The South Carolina Blue Ridge Railroad has a summit of 2,151 feet, passed by a tunnel 5,562 feet long, and approached by gradients of 1 in 75.