Scientific American.

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

VOLUME XI.] NEW-YORK, NOVEMBER 3, 1855. [NUMBER 8.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Ful on Street, N. Y. (Sun Buildings.)
BY MUNN & COMPANY.

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

Agents.

Federhen & Co., Boston. | Dexter & Bro., New York
A. Winch, Philadelphia. | E.E. Fuller, Halifax, N S.
A. G. Courtenay, Charleston. | S.W.Pease, Cincinnati, O.
Avery, Bellford & Co., London | MM.Gardissal & Co., Paris

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

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

TERMS—$2 a-year,—$1 in advance and the remainder in six months.

Scouring Castings of Iron.—Coating with Zinc.

All castings of iron are surrounded with a scale which must be removed if the articles are to be galvanized or scoured bright. The way to remove this scale is to steep the articles for about 6 hours in a liquor composed of one part of sulphuric acid to ten parts of water, then take them out and scour them in warm soft water with fine sand. Some use the acid solution much stronger than the one described; it removes the scale sooner, but is more disagreeable to use.

Articles to be galvanized after being scoured bright and washed in warm clean soft water are dried, and are then fit to be dipped into the galvanizing pot. This is an iron pot placed on a suitable furnace containing molten zinc; the surface of it is covered with ground white sand or glass. This is to prevent the zinc escaping in the state of gas, it being a volatile metal. A vessel containing a strong solution of sal ammoniac, or the chloride of zinc, is placed beside the zinc pot, and into this is dipped (for about a minute) each article, previous to immersing it in the molten zinc. The articles must be cautiously and carefully handled in the molten zinc, in which they are kept from three to five minutes. After they are taken out of the zinc they should be cooled slowly, then washed in soft water. It is very difficult to make zinc take on smoothly, especially on chains for pumps.

Wire is galvanized or coated with zinc in the manner described, only it is reeled off a winch through the ammonia, or chloride of zinc solution, then slowly through the molten zinc, from which it is wound on another reel. It does not make much matter if a superfluity of zinc is roughly taken upon the wire as it can be smoothed by running it through a draw plate; but chains cannot be so smoothed. Sheet iron is galvanized in the same manner, and as the sheets can be rolled after being galvanized, a little roughness of surface does no harm.

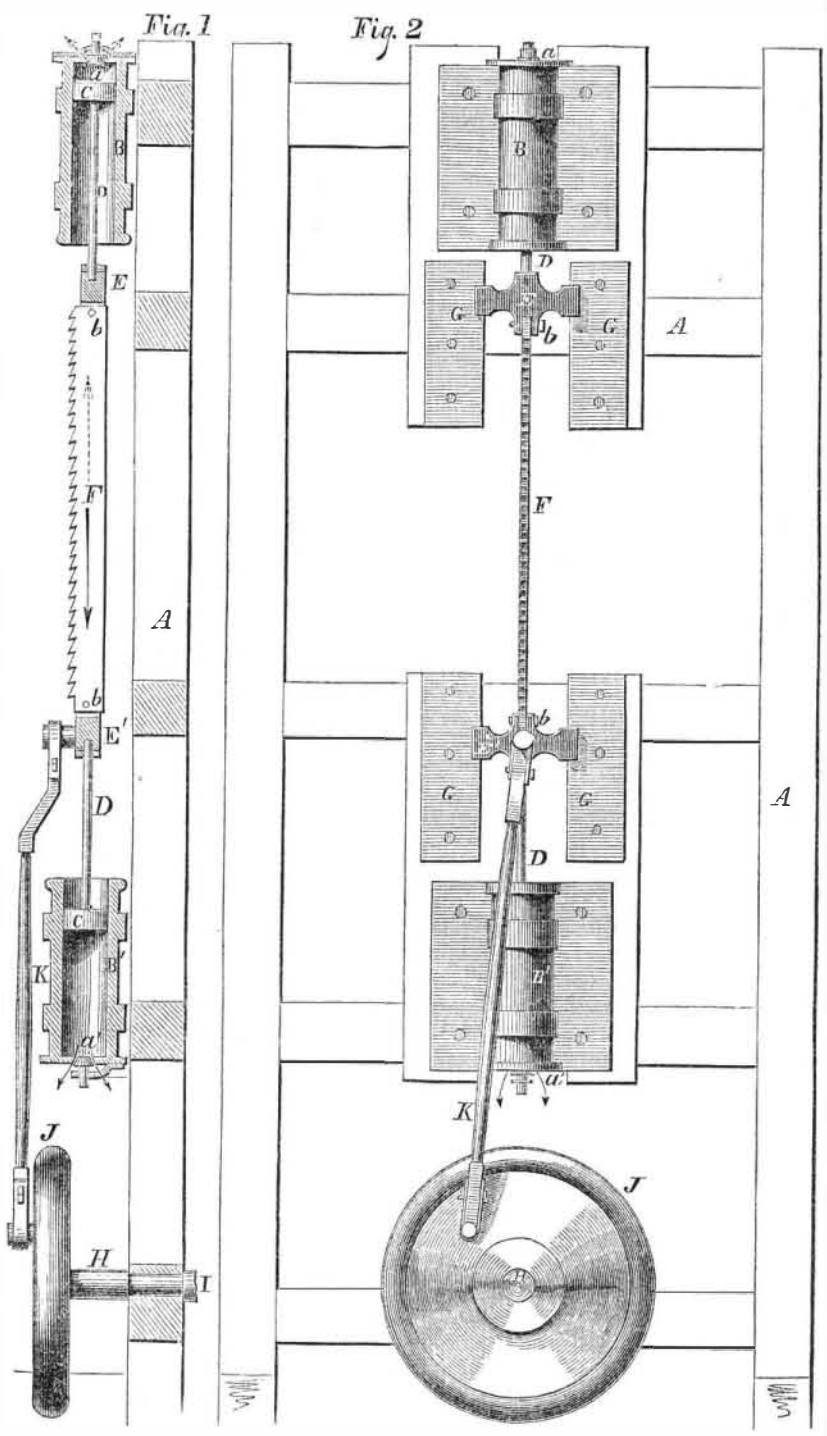
Boring in Hard Rocks.

In a brief article by H. A. Hildreth, in the *Mining Magazine*, published in this city, the great difficulty of approaching the fortifications of Sevastopol by sap and mine is attributed to the hardness of the rocks in the neighborhood of that city. The rock is *basalt*, which is nearly as hard as *trap*, and much harder than granite. The cost of boring in trap rock for minerals is about twice as much as in granite, and three times more than in sandstone.

Trap is among our hardest rocks, and it is this that forms the Russ and the new small block pavements of this city. A stupendous dyke of this rock, eight miles wide, commences at the Highlands of the "Nevisink," and flanks the west shore of the Hudson river for fifty miles above Jersey City. This dyke contains as much paving material as would suffice to pave all the cities of the United States for half a century to come. It is a fortunate thing for New York that such excellent paving stones can be obtained in such abundance and so near at hand.

It is reported that the British Government has made large purchases of gutta percha knapsacks manufactured by the American Gutta Percha Company, this city.

STRAINING SAWS BY ATMOSPHERIC PRESSURE.



On the 14th of August last, a patent was granted to A. Brown, and Abel Coffin, Jr., of Sabine City, Texas, for the excellent improved method of straining saws by atmospheric pressure, represented by the annexed figures—figure 1 being a transverse vertical section of the saw frame with the improvement attached, and fig. 2 a front view. Like letters on the figures indicate similar parts.

The improvement refers to that class of atmospheric straining of saws in which a cylinder is arranged at each end of the saw, with their inner ends open, and a piston in each, so actuated as to pull on the saw by simple atmospheric pressure, caused by the production of a vacuum between the pistons and the cylinder heads. The nature of this invention consists in the simple manner of producing this vacuum—atmospheric pressure having been applied to saws before, but not in the same way. The usual method of straining saws by atmospheric pressure by the use of two cylinders, is by connecting the closed parts of them by a pipe communicating with an air pump. The improvement represented simplifies such an arrangement; it obtains the necessary vacuum in the cylinders for straining the saw, and yet dispenses with the connecting pipe and the air pump usually employed. This is accomplished by providing each cylinder with a free snifting valve, by which the reciprocating action of the saw itself is made to produce the necessary vacuum in the cylinders behind the straining pistons. F represents the reciprocating saw attached at its ends by pins, *b*, to cross heads, E E'. H is the revolving driving shaft of the saw, to which it communicates reciprocating motion by means of a pitman, K, loosely attached to the lower cross head, E', of the saw, and operated by a wrist pin on a wheel, J, made fast to the revolving shaft, H. The saw is made to reciprocate in a true vertical course by guides, G G, along or up and down which the cross heads, E E', slide. These guides are firmly connected to the fixed framing, A, of the mill. B B' are the vacuum cylinders, provided with heads, or closed at their outer ends but open at their inner ends. In these cylinders the straining pistons, C C', are arranged and connected by rods, D, to the cross heads, E E', of the saw. They are made to pull on both ends of the saw by ordinary atmospheric pressure acting on the faces of the pistons exposed to the inner or open ends of the cylinders, and thus straining the saw, or keeping it straight and free from buckling, a vacuum being maintained between the pistons and closed ends or heads of the cylinder, by which means the simple atmospheric pressure is made available as a straining force, the pistons of course reciprocating with the saw, as in other arrangements of the kind.

a a' are puppet snifting valves, freely hung, and provided for the closed ends of the cylinders, B B'.

OPERATION—Previous to starting the saw to cut, or feeding the log, the saw receives a reciprocating motion—up and down—which suffices to expel any air from the inside of the cylinders through the snifting valves, *a a'*, as shown by the arrows, fig. 1. The sevalves, it will be observed, open outwards, and are fitted snug in their seats, so that when the air is expelled the pressure of the atmosphere on the outside closes them, and thereby a vacuum is always maintained in the cylinders. The pistons, C C', in the cylinders are therefore exposed to the pressure of the atmosphere on their two inner ends, acting in opposite directions to stretch the saw. With valves and pistons carefully fitted to work air tight, a vacuum will be constantly maintained in the cylinders, and no air will be required to be driven out at each stroke. But even with a small leak, sufficient air cannot get inside between the seat and valve, to vitiate the vacuum to such an extent as would injure the straining power of the full pressure of the atmosphere exerted on the outside of the pistons. When the saw is not cutting, it will be observed that, by reciprocating it once or twice after it has been standing still, it will not buckle, in driving out any air that may have found access to the cylinder. When the cylinders are once cleared of air, the snifting valves will remain fixed and stationary, and the pistons will then have the full pressure of the atmosphere (15 lbs. on the square inch) acting on them to keep the saw perfectly strained. The improvement is a beautiful and simple one; it does away with the branch connecting pipes and air pump, and does great credit to the inventors.

More information may be obtained respecting it by letter addressed to the patentees at Sabine City, Texas.

A Man of Science Gone.

Professor Johnston, the author of "*Chemistry of Common Life*," and well known in the scientific world for his professional ability, died recently, in Durham, England, in his 59th year.

Three years since Prof. J. was in the United States, and delivered the Annual Address before the New York State Agricultural Society, at Syracuse. He was the author of a number of excellent works on Agricultural Chemistry, and was distinguished for his profound knowledge of agricultural science. He was highly respected in our country, both for his scientific acquirements and his manly virtues. All his works have been republished in this city; this shows the estimation in which he was held, and the practical character of his writings.

Coal of Recent Formation.

At Haroe Island, the Kane Arctic Expedition found coal apparently of recent formation. The grain of the wood was still perceptible, but it was interspersed with small masses of a very pure resin. The supply was limited in depth only by the frost, and was so loose that it could be shoveled up without difficulty. It was found to burn well.

Adulterated Food in England.

At the late meeting of the British Association, Dr. Pearson, in the chemical section, asserted that there were only two articles manufactured for food which were not adulterated, common salt and refined lump sugar. He challenged any gentleman present to add another article to the list.