[For the Scientific American.]

Another Fire Annihilator.

As Fire Annihilators are now "all the go," it occurs to me that I ought to give the public the advantage of a hint—a rather broad one, too—that I received some years ago. I had occasion to make a large quantity of a certain tincture. I used a three gallon glass jar, which was nearly full of *absolute* alcohol, and a very inflammable gum. The weather being cool, I thought of warming the jar to hasten the process, and for this purpose placed it in a basin of hot water. This produced expansion of the bottom of the jar too suddenly, and it broke, letting the strong spirits flow over the floor. The whole room was occupied on every side with bundles of papers, and loose newspapers and other combustibles, were scattered in *literary* confusion over the floor. The room was a back one, under a bank, with no access or egress except a door entering into a front room that opened into a street. The spirits, in a moment, spread to the fire-place, and, of course, instantly were in flames. In less than a minute all the combustibles were on fire, and the room was full of the vapor evolved from the spirits. I could not breathe in the room, but had the presence of mind to remain silent. I ran to the door to get fresh air, and then into the flames, endeavoring to quench them, all to no purpose. At last, when all the bundles of papers, and other combustibles, had caught fire, and I was on the point of giving the alarm, I happened to notice a box of *air-slacked lime* that had been for some time in one corner of the room. I took a handful and scattered it on the flames, and saw, to my great delight, that it instantly quenched the flames where it reached them; I then took a shovel and scattered the lime freely over the burning papers and spirits on the floor, and in less than a minute this fearfully threatening conflagration was "annihilated," and I went into the street to get breath, breathing, you may be sure, more freely than when in the flames. Before resorting to the lime I had tried, in vain, all sorts of smothering expedients, and while at work with the lime, had to run to the door for breath several times, as breathing in the room was impossible. Since that time I have often thought of this incident. I have inquired of my scientific books for a reason for the quenching of the flames so promptly by the slacked lime, but can find none. I suppose there was a bushel of the lime, soft and powdery as the finest hair powder, and when a small shovelful was thrown into the flames, broad-cast, it was light and dusty. The effect upon the flames was wonderful. The instant the powdery lime came in contact with the flames they were quenched. I am even yet, at this distant day, incapable of depicting my fright. The nature of the contents of the room, the quantity of strong spirits that covered the floor, all in flames, a banking house above me, all I had in the world in the room on fire,—the fright, you may judge, was awful; the relief most providential and heart cheering. That hazardous but accidental experiment has given me more confidence in a bushel of air-slacked lime than in all the "Phillips' Annihilators" of England and America put together. G. B. S.

Baltimore, Md., 1851.

A Machine.

What is a machine? A contrivance by man to increase his power over matter. If the power of man, then, to subdue matter be a good, the increase of that power must be a greater good, and its ultimate perfection the greatest of all good in that respect. The mind may conceive the grandest projects for human improvement, but the hand alone can execute them. There have been thousands of instances of this kind which the world has never known, and which must have died away in the brain that conceived them. One of the principal causes of man's advancing so slowly in the path of amelioration, has been the incapacity of the hand to execute the conceptions of the head; the nearer the power of the hand approximates to that of the head, the more rapid will be his advance. Man is the creature of machinery in a civilized state; deprive him of it, and he instantly becomes helpless and unprotected. "Man himself is a magnificent machine, and God his Creator," says the pious and eloquent Dr. Barrow, "is the first of mechanicians." Look at the form of man, either in repose or activity, and you cannot but admire its beauty. What a majestic pile is his bony construction—how ingeniously devised, and how exquisitely formed—how true in principle and how admirable in practice.

Recent Foreign Inventions.

Sugar.—Messrs. Robert and John Oxland, chemists, of Plymouth, Eng., recently secured a patent for improvements in manufacturing sugar. They claimed the use of the acetate of alumina for purifying and refining sugar, in a patent secured in 1849, the alumina so employed being removed by the use of lime. They have found, however, that the whole of the alumina is not removable, by this means, from the solution, but that both it and the molasses contain alumina; they therefore recommend the addition of a solution of superphosphate of alumina, or superphosphate of lime to the syrup, in all cases in which the acetate of alumina has been employed; the syrup is boiled for two or three minutes, and the excess of acid neutralized by addition of either aluminate of lime, saccharate of lime, lime-water, or milk of lime. Instead of acetate of alumina alone, or in combination with phosphoric acid, phosphates may be used to produce the same effect; their employment also is attended with the additional advantage, that the re-agent used is not left in solution in the saccharine solution.

If, for instance, it be desired to treat saccharine liquids, such as an ordinary solution of Muscovado sugar, the following process is to be adopted:—The sugar being dissolved as usual, in the blow-up pan, no blood is added, but a soluble phosphate is dissolved in the water used for the solution of the sugar. One and a-half pounds of crystallized phosphate of soda will usually be found to be a suitable proportion of one ton of sugar. The syrup thus formed is brought to the boiling point, and a sufficient quantity of either saccharate of lime, milk of lime, lime-water, or aluminate of lime, is added to neutralize any acidity which may be present, after which the syrup having been brought to the density of 25° to 30° Beaume, is passed through bag-filters of the ordinary make, and is thus defecated. Water is then put through the filters to dissolve out all the saccharine matter left thereon, and the solution is employed to dissolve the next batch of sugar operated upon. The syrup, as thus obtained, may be either at once placed in the vacuum pan, or be first treated with a solution of from five to eight per cent. or more of hydrate of alumina (dried at 212°), which being diffused through it, will effect the removal of some coloring matter remaining after the previous process, and thus render the use of animal charcoal unnecessary.

The alumina, mixed with the other residue in the filter-bags, may be separated therefrom by ignition, and the product applied to the preparation of hydrate of alumina or of superphosphate of alumina, or when well washed, it may be mixed with fresh hydrate of alumina, and used in that state.

In the application of superphosphate of alumina to the purposes herein specified, this salt is added to the water used in the blow-up pan, in the proportion of about six pounds of alumina dissolved in phosphoric acid, for each ton of sugar. In bringing the syrup at a density of from 25 to 30 degrees Beaume, to the boiling point, a sufficient quantity of either aluminate of lime, saccharate of lime, milk of lime, or lime-water is added, as will serve to neutralize the excess of acid, after which the process is conducted as before described, and the alumina again recovered from the contents of the filter-bags.

The patentees give the following directions for the preparation of the phosphoric acid employed in the manufacture of the superphosphate of alumina above-mentioned:—Bones are first calcined to whiteness, then ground and digested in such a quantity of muriatic acid as will serve to dissolve out the carbonate of lime only; the residue is then washed and dried, and a sufficient quantity of water added to form a thin paste; sulphuric acid is then added in such proportion as will dissolve about ninety-seven per cent. of the lime of the phosphate. This mixture is well stirred, and kept at a temperature of about 90° Fah. for twenty-four hours, after which it is lixiviated with water. The first product gives a strong solution of phosphoric acid, and is employed for dissolving the alumina, whilst the subsequent washings are reserved for the lixiviation of fresh batches. By the action of phosphoric acid on alumina, an insoluble phosphate of alumina is obtained; to this solt, just as much phosphoric acid is added as will suffice to dissolve it, after which it is filtered off for use.

The aluminate of lime is made by dissolving alumina in a solution of caustic potash or soda, and precipitating with lime-water or milk of lime; the aluminate of lime thus obtained is well washed, and when used is diffused through water.

In the treatment of sugar direct from the cane, the solution is first defecated with aluminate of lime, or lime rendered acid by means of superphosphate of alumina or superphosphate of lime, and after two filtrations, the solution is brought to a density of from 25° to 30° Beaume, and then treated with phosphate of soda, as in the case above-mentioned, and boiled down in the usual way. The patentees give the preference to aluminate of lime over saccharate of lime, lime-water, and milk of lime.

Smelting Ores.—Mr. Wm. Longmaid, of London, recently took out a patent for the smelting of ores, &c., and he received the Council Medal at the Great Exhibition. The present improvements are principally based on certain previously patented processes of his for obtaining copper and silver, and for the manufacture of alkali, by the calcination and decomposition with common salt of iron pyrites and other ores and minerals containing sulphur: they have also relation to a method of employing anthracite coal in the production of iron from the oxide thereof.

The first improvement specified consists in the application of coke and anthracite coal in the decomposition of ores or minerals, by calcining them in mixture with common salt. When using coke for this purpose, the patentee prefers to employ a furnace closed by a door, and to supply the ashpit thereof with water, which, by becoming converted to vapor, rises and facilitates the combustion of the fuel. When employing anthracite, it is mixed with about one-sixth part of coking bituminous coal, and, being placed in front of the furnace on a plate for that purpose, is partially converted into coke before being supplied to the furnace. In this case, also, the ashpit of the furnace is supplied with water. The condensation of the volatile products resulting from these operations will be found to be much facilitated, and the working of the processes generally improved by introducing steam into the flue leading from the furnace to the condenser.

The second part of the invention consists of an improved method of effecting the precipitation from their solution of the salts of silver and copper, which are resulting products of all the operations of decomposing ores and minerals containing them by calcination with common salt. The process of calcination is conducted according to the directions given in previous specifications, and a solution of alkaline salts employed to dissolve the silver and copper and other products from the calcined mass. In order to separate the silver, the patentee causes the solutions to pass through vessels containing metallic copper, by which the silver is precipitated, an equivalent of metallic copper being dissolved at the same time. When the whole of the silver is precipitated, the copper is obtained by metallic iron in the usual manner. The alkaline solution is subsequently employed in the manufacture of sulphate of soda, or to disssolve fresh quantities of silver and copper.

The third improvement has relation to the manufacture of sulphate of copper from the sulphide thereof, and consists in calcining the regulus or other sulphide obtained by such processes as are above alluded to, at a low temperature with access of atmospheric air, by which sulphate of copper and soluble salt of silver will be produced. These products are then dissolved in water, and crystals of sulphate of copper obtained after precipitating the silver by means of copper. The precipitate is treated in the usual manner to obtain the silver in a metallic state.

The fourth head of the invention consists in separating silver and copper from their solutions by means of the sulphide of calcium, alkali waste, and compounds of alkaline and metallic salts, such as "black" or "green ash," both of which are compounds resulting from the patentee's processes for the manufacture of alkali. These materials may be employed either in a pulverized state or in solution.—The residual products containing the precipitated silver and copper are fluxed and converted to regulus for subsequent operations.

The fifth part of the invention relates to the treatment of ores containing a large proportion of silver with little copper or sulphur. Solutions are obtained therefrom (by any ordinary processes), which, when dilated to about 30° Twaddle, and boiled, yield a deposit of chloride of silver in a metallic state.

The sixth branch of the invention consists in separating silver and copper from the regulus obtained from any of the above-mentioned processes by gradually calcining the same with from five to ten per cent. of common salt. The product is then treated with water to dissolve out the metallic salts, which will precipitate, and may be collected and smelted in the usual way.

The last improvement consists in obtaining iron from the oxide thereof by mixing the same in a granulated state with carbonaceous matters in sufficient quantity to deoxodize it, and with clay enough to provide for its being made into balls, which, when smelted in a reverberatory furnace, yield iron of fine quality. The carbonaceous matter preferred for this purpose is anthracite coal or charcoal as free as possible from sulphur.

Stone Dressing.—We perceive that Mr. Charles Morey has secured a patent in London for a machine for dressing stone, which is similar to the one exhibited at the Fair in this city, in 1849. The cutters are broad chisels with serrated edges, and are placed in a direct line across the stone, but are inclined in the direction of the transverse of the table on which the stone is placed, which is similar to the bed of an iron planing machine. The chisels have a reciprocating motion, like planing a board. The stone moves forward slowly to the cutters. Another modification of the machine, is a series of rollers with serrated edges—the cutters having a rolling motion.

We are indebted to our invaluable exchanges, "Newton's Repertory of Arts," "Patent Journal," "Mechanics' Magazine," and other London Journals," and to the "Genie Industriel," &c., of Paris, for the above, in substance.

The Introduction of Coal into England.

When this fuel was first introduced into England the prejudice against it was so strong that the Commons petitioned the crown to prohibit the "noxious" fuel. A royal proclamation having failed to abate the growing nuisance, a commission was issued to ascertain who burned coal within the city and its neighborhood, and to punish them by fine for the first offence, and by demolition of their furnaces if they persisted in transgression. A law was at length passed making it a capital offense to burn coal in the city of London, and only permitting it to be used in the forges in the vicinity. Among the records in the Tower, Mr. Astle found a document importing that in the time of Edward I, a man had been tried, convicted, and executed for the crime of burning coal in London. It took three centuries to entirely efface this prejudice.

Sinking of a Tennessee Mountain.

It is stated that a short time since, a portion of Walden's Ridge sunk, with a noise resembling deep-toned thunder, leaving a huge gap in the timber that fringes the sides of the ridge, extending about two miles in a parallel direction with the top. The gap in the dense timber appeared to be about sixty or a hundred feet in width, and the fissure in the earth reached to an unknown depth, in which trees of the largest size were torn up, and enormous rocks, which had probably lain concealed for ages, were rent from their primitive beddings and laid bare. The foundation on which the mountain rests is supposed to have given way.

The Railroad up the Sixth Avenue has been commenced.