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The young man's book of amusement

Halifax, 1848

The Art of Making Fire-Works

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THE ART OF MAKING FIRE-WORKS.

ABOVE all things it is necessary to have good materials, and that these be prepared in a proper manner, in order to execute any task combining so many ingenious contrivances as the making of fire-works undoubtedly require. The manufacture of your own gunpowder is not desirable, and therefore postpone the description of that art—you will no doubt buy the best; but as the admixture of charcoal is necessary, and much of your success depends upon having it good—observe that the less of *sap* there may be in the wood before it is made into charcoal, the better will be the gunpowder that is made with such charcoal. Dr. Watson made the discovery, and communicated the fact to his Majesty's Government, but the French and Germans were in the secret many years before, and always beat us at *long shot*. The wood is to be dried in an oven or *iron boiler*, with a slow fire, and the charcoal kept in close boxes from the influence of atmospheric air, until the moment of being brought to use.

How to meal Gunpowder, Brimstone, and Charcoal.

There have been many methods used to grind these ingredients to a powder for fireworks, such as large mortars and pestles made of ebony, and other hard woods; but none of these methods have proved so effectual and speedy as the new invention, of the *meal table*. It is made of elm, with a rim round its edge, four or five inches high; and one end is a slider, which runs in a groove and forms part of the rim, so that when you have taken out of the table as much powder as you wish, with a copper shovel, you may sweep all clean out at the slider. When you are going to meal a quantity of powder, do not put too much on the table at once, but when you have put in a good proportion, take a muller and rub it therewith till all the grains are broke; then sift it in a lawn sieve, that has a receiver and top to it; and that which does not pass through the sieve, return again to the table and grind it more, till you have brought it all fine enough to go through the sieve. Brimstone and charcoal are ground in the same manner as gunpowder, only the muller must be made of ebony, for these ingredients being harder than powder, would stick in the grain of the elm, and be very difficult to grind; and as the brimstone is apt to stick and clog to the table, it would be best to keep one for that purpose only, by which means you will always have your brimstone clean and well ground.

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To make Touch-paper.

Dissolve in some spirits of wine or vinegar, a little saltpetrè; then take some purple or blue paper, wet it with the above liquor, and when dry it will be fit for use. When you paste this paper on any of your works, take care that the paste does not touch that part which is to burn. The method of using this paper is, by cutting it into slips, long enough to go once round the mouth of the serpent, cracker, &c. When you paste on these slips, leave a little above the mouth of the case not pasted; then prime the case with *meal powder*, and twist the paper to a point.

Of the vertical Scrole Wheel.

This wheel may be made of any diameter, but must be constructed thus:—Have a block of moderate size, into which fix four flat spokes, and on them fix a flat circular fell of wood. Round the front of this fell place port-first; then on the front of the spokes form a scrole either with a hoop or strong iron wire; on this scrole tie cases of brilliant fire, in proportion to the wheel, head to tail. When you fire this wheel, light the first case near the fell; then as the cases fire successively, you will see the circle of fire gradually diminish; but whether the illuminations on the fell begin with the scrole or not, is immaterial.

A slow Fire for Wheels,

Must be composed of saltpetre, four ounces ; brimstone, two ounces ; and meal powder, one ounce and a half.

A dead Fire for Wheels.

Saltpetre, one ounce and a quarter ; brimstone, a quarter of an ounce ; lapis-calaminaris, a quarter of an ounce ; and antimony two drachms.

For a Blue Flame.

Meal powder, saltpetre, and sulphur vivum : the sulphur must be the chief part. Or, meal powder, saltpetre, brimstone, spirit of wine, and oil of spike, but let the powder be the principal part.

Of Port or Wild Fires.

Saltpetre, one pound two ounces ; meal powder, one pound and a half ; and brimstone, ten ounces. This composition must be moistened with one gill of linseed oil.

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A Brilliant Fire.

Meal powder, six pounds ; saltpetre, half a pound ;
brimstone, two ounces ; and steel-dust, twelve ounces.

*Of such Ingredients as show themselves in Sparks
when rammed into choaked Cases.*

The set colours of fire produced by sparks are divided into four sorts, viz. the black, white, grey, and red ; the black charges are composed of two ingredients, which are meal powder and charcoal ; the white of three, viz. saltpetre, sulphur, and charcoal ; the grey of four, viz. meal powder, saltpetre, brimstone, and charcoal ; and the red of three, viz. meal powder, charcoal, and saw-dust.

There are, besides these four regular or set charges, two others, which are distinguished by the names of compound and brilliant charges ; the compound charge being made of many ingredients, such as meal powder, saltpetre, brimstone, charcoal, saw-dust, sea-coal, antimony, glass-dust, brass-dust, steel-filings, cast iron, tanners' dust, &c. or any thing that will yield sparks ; all which must be managed with discretion. The brilliant fires are composed of meal powder, saltpetre, brimstone, and steel-dust ; or with meal powder and steel filings only.

Of Saltpetre.

Saltpetre being the principal ingredient in fire-works, and a volatile body, by reason of its inflammable and ærial parts, is easily rarefied by fire; but not so soon when foul and gross, as when purified from its crude and earthy parts, which greatly retard its velocity; therefore when any quantity of fire-works is intended to be made, it would be necessary first to examine the saltpetre; for if it be not well cleansed from all impurities, and of a good sort, your works will not have their proper effect.

To Pulverize Saltpetre.

Take a copper kettle, the bottom being spherical, and put into it fourteen pounds of refined saltpetre, with two quarts or five pints of clean water; then put the kettle on a slow fire, and when the saltpetre is dissolved, if any impurities arise, skim them off, and keep constantly stirring it with two large sticks till all the water exhales. When done enough, it will appear like white sand, and as fine as flour; but if it should boil too fast, take the kettle off the fire, and set it on some wet sand, which will prevent the saltpetre from sticking to the kettle. When you have pulverized a quantity, be careful to keep it in a dry place, not exposed to the air.

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To make Squibs and Serpents.

First make the cases, of about six inches in length, by rolling slips of stout cartridge paper three times round a roller, and pasting the last fold : tying it near the bottom as tight as possible, and making it airtight at the end with sealing-wax. Then take of gun-powder half a pound, charcoal one ounce, brimstone one ounce, and steel filings half an ounce, (or in like proportion), grind them with a muller or pound them in a mortar. Your cases being very dry and ready, first put a thimble-full of your powder, and ram it hard down with a ruler ; then fill the case to the top with the aforesaid mixture, ramming it hard down in the course of filling two or three times ; when this is done, point it with touch paper, which should be pasted on that part which touches the case, otherwise it is liable to drop off.

To make Crackers.

Cut some stout cartridge paper into pieces, three inches and a half broad, and one foot long ; fold down one edge of each of these pieces lengthwise, about three quarters of an inch broad ; then fold the double edge down a quarter of an inch, and turn the single edge back half over the double fold. Open it and lay all along the channel which is formed by the fold-in of the paper, some meal powder ; then fold it

over and over till the paper is doubled up, rubbing it down every turn; this being done, bend it backwards and forwards, two inches and a half, or thereabouts, at a time, as often as the paper will allow. Hold all these folds flat and close, and with a small pinching cord, give one turn round the middle of the cracker, and pinch it close; bind it with packthread, as tight as you can: then in the place where it was pinched, prime one end, and cap it with touch paper. When these crackers are fired, they will give a report at every turn of the paper; if you would have a great number of bounces, you must cut the paper longer, or join them after they are made; but if they are made very long before they are pinched, you must have a piece of wood with a groove in it, deep enough to let in half the cracker; this will hold it straight while it is pinching.

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