For the Scientific American.

Poisonous Acius.—Oxalic Acid.

This acid is characterized by white crystals in four sided prisms. It is very soluble in water, very sour and very poisonous. This acid looks something like epsom salts and serious results have arisen by mistaking the one for the other. Oxalic acid is decomposed at a high heat, into *water, carbonic and formic acids.* It can at once be known from epsom salts by being exceedingly sour in taste, while the salts are very bitter. No person need mistake the two. Oxalic acid volatizes when heated on a platinum foil, while epsom salts only lose their water of crystalization.

If oxalic acid is weak, or has been suspected to have produced death in any person, one test is the nitrate of silver, which produces a precipitate in a solution that contains 1-4000 part by weight of oxalic acid. This oxalate of silver is a fulminating powder, and when ignited, it leaves no carbonaceous residue.—Sulphate of lime also produces a white precipitate with oxalic acid solution. Sulphate of copper produces a greenish white precipitate in oxalic acid solution, which is not easily soluble in hydrochloric acid. Oxalic acid is the best substance known for erasing iron spots on linen. No other acids equal it. It is also used by those who bleach straw and leghorn hats to clear up their color and take out the iron stains. The straw hats are dried out of it in the sun and it does not seem to injure their texture so readily as some other acids. Some housekeepers use oxalic acid to clean their brass ornaments, such as stair rods, door knobs and many other things. There is therefore a danger of children being poisoned with it, as it very often happens that what some are forbid to do—that they are sure to do. The antidotes for this poison are magnesia, and chalk. Simple remedies and easily administered.

Sulphuric acid is also sometimes used in families. It cannot strictly be said to be poisonous as it may be used in small quantities diluted in water, and no evil effects produced. It will destroy life, however, if taken into the stomach in a strong state. A simple antidote is saleratus, or any alkali—or chalk or magnesia. We would prefer the latter as an antidote. We have known some cases, where urine was successfully (because convenient) administered.

Nitric Acid is also a poison, but we never knew of any cases of poisoning by it. It is a dangerous acid to use. Its fumes are poisonous, and it should be used with great caution in all departments where it may be necessary to employ it. It stains the skin yellow and makes white silk a beautiful golden color.—It is injurious to the texture of woolen cloth and is used to produce the orange colors on blue table spreads. Ammonia or potash are the best antidotes.

Light and the Eye.

On closing the eyes, after having looked steadfastly at a sheet of white paper held in the sun for about a half a minute, and covering them without pressure to exclude extraneous light, the figure of the paper remains invisible for some time. At first it is generally white and then gradually changes through the colors of the spectrum. All the colors are seldom seen at the same trial; and it rarely happens, when one or more are missed that they afterwards appear. Thus when the change is from green to red, yellow or orange are seldom seen. The change from white generally commences with a light indigo or blue, and terminates with red or some compound of it, but sometimes with a deep blue or violet. The colors are generally seen at the edges of the figure first, though this is not always the case; and when they once appear, they often remain mixed up with those that succeed. Many curious modifications and confused mixtures of colors will be perceived at times; but it seldom happens that the colors develope themselves in the first instance, contrary to their order, in the spectrum, although when the last has appeared, they occur in various ways.

Superior Red Ink.

Take a small quantity of the best carmine, about the size of a pea, and put it into a small phial with a little spirit of hartshorn to dissolve it. When dissolved put as much pure water in it as will give it the desired shade, and then let the bottle not be corked for some time, to allow the hartshorn to evaporate, when it is ready for use. This ink is very permanent and does not change its color.

The common red ink is made by boiling brazil wood, taking the strong solution and adding to it a small quantity of dissolved alum. It looks all the better to have a few drops of the muriate of tin added to the liquor—not too much however, or it will injure the pen. A quill is the only pen to use red ink with. If a small quantity of sumac and quercitron bark be boiled along with the brazil wood it makes the ink still better—of a scarlet shade. Brazil wood itself is rather on the blue shade. For common purposes, we advise those who use much red ink, and make it themselves—not to forget the sumac at least, but a very small quantity will suffice. The liquor should be strained through a cloth as soon as it is boiled, and when cold bottled and kept well closed in the bottle.

Blue Writing Ink.

Four ounces sulphate of iron, 2½ drachms of sulphuric acid, 1 ounce or q. s. nitric acid, 6 ounces ferrocyanide of potassium; water q. s. Dissolve the sulphate of iron in one pint of water, then add the sulphuric acid, and heat the solution to boiling, then pour in the nitric acid in small quantities at a time, continuing the boiling until the iron is per oxidized. Dissolve the ferrocyanide of potassium in two pints of water, and add the former solution, when cold, to this. Collect the precipitate that will be formed on a filter, and carefully wash it with distilled water, until the blue precipitate begins to dissolve in the water. It will now be found to be soluble in pure water, although insoluble if any other salt be present. Rub what remains in a mortar with distilled water until a clear solution is obtained of the required intensity of color. A little oxalic acid is sometimes added, but this is not necessary, if the above instructions be carefully followed, as the precipitate will be perfectly and permanently soluble in pure water.

Fire Arms Differently Charged.

Balls which fit accurately the bore of a piece, have the greatest effect, as they do not come out so readily but give time for the greater quantity of powder to ignite.

When the powder is rammed violently down, its effect is no greater, but somewhat less than when barely pressed down with the ball upon it.

Gunpowder around a ball diminishes its effect, as it expands in all directions, and when it is upon the top of a ball, it must in some measure act counter to its progress.

By taking a ball and putting a little powder under and considerable before it, its effects may be almost nullified, and yet there will be considerable noise when the gun is discharged.

To Stop Horses Suddenly.

It is said that horses which run away will stop at once, if there is any thing thrown over their heads, which hinders their seeing. If therefore there can be a screen fixed about the head stall, say of india rubber cloth, which can be drawn down by a cord over the horse's eyes when they run away, they will thus at once be stopped. Such an arrangement connected with two small cords to the seat of the carriage to be pulled from within, might be a great safeguard against horses running away, of which there are many good ones that seem to have a passion for it. J. W.

To Prevent a Bruise from Becoming Discolored.

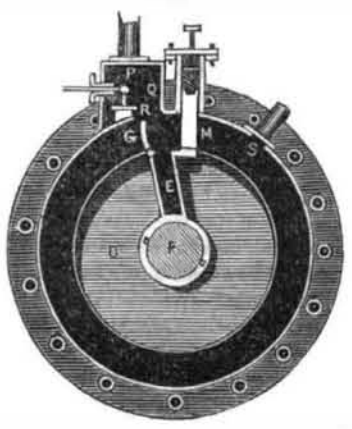
It is said that blood can be prevented from settling in a bruise, by applying to the place a cloth wrung out of very warm water, and renewing it until the pain ceases. The moisture and heat liquify the blood, and send it back to the proper channels, which, by neglect, or the use of cold applications, would be coagulated, and fixed in green and black blotches directly under the skin.

History of the Rotary Engine.

Prepared expressly for the Scientific American.

EVANS' ROTARY ENGINE.

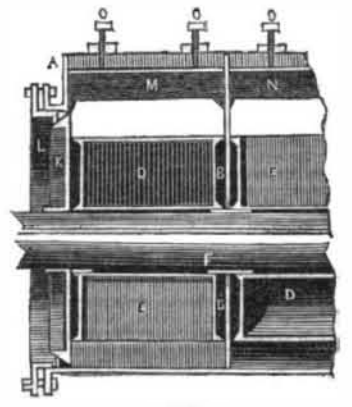
FIG. 54.



This engine was invented by an English engineer named John Evans, of Wallingford, in 1828. It shows how liable practical men are to fall into error as well as mere theorists, and we will never be surprised at this after James Watt, so gifted and eminently scientific, fell into like errors.

This engine is composed of a long cylinder A A, laid horizontally, and divided into two equal parts by a disk, or broad flanch B, in the interior; in each department is a drum D, composed of two concentric cylinders, cast in one piece, and a channel E, is formed, extending the length of the drum, and reaching from the larger to smaller cylinder, the object of which is stated to be to obtain greater su face. Through these drums passes an axis F, with small projecting feathers, fitted into corresponding grooves in the interior cylinder of the drum, which thus comes round the axis. Attached to the periphery of the drum, by a hinge, is a flap or piston G, which is of somewhat greater diameter than the channel H, left between the drum and the exterior cylinder A, and placed immediately over the cleft or channel E. The drums are pressed against the disk B, by the end plates K, of the same diameter as the cylinder A, and having their uppersurface bevelled round the rim to receive the packing, which is covered by a flat hoop, pressed down by a short cylinder L, by screws screwing into the flanch of A, so that no steam can escape between the drum and the disk B, or the end plates K. The drums must be so placed on the shaft F, that when the cleft E,

FIG. 55.



of one drum is on the highest part of the shaft, that on the other drum shall be on the lowest part of the shaft. Along the upper side of the cylinder A, is fixed a groove, through which descends a stout shutter, on to the drum or abutment M, faced with brass, and having above it a packing of hemp N, covered with a plate of metal, pressed down by the screws O. The steam is admitted by a steam pipe P, into the steam box Q, (of which there are two, one to each drum,) furnished with a slide valve R, regulated by an eccentric on the axis; S is the eduction pipe. The steam being admitted into one compartment, acts against the shutter M, and the piston G, and causes the drum and shaft to revolve; when, by the revolution of the drum, the piston of the other drum is carried past the aperture in the steam box G, the steam is admitted to it, and shut off from the first compartment, and the revolution of the shaft is thus continued, by the admission of steam into each compartment alternately, during half a revolution. The eduction pipe may communicate either with the condenser or the atmosphere.

The steam acting as proposed by Mr. Evans can have no tendeacy to force the piston either way.

Curious mode of Grafting the Grape Vine.

A gentleman in the neighborhood of Oporto, split a vine shoot (white grapes,) very carefully down the middle, cutting the bud in half, and then split a corresponding shoot on a black vine, and united them as in common grafting, and, after many experiments, succeeded in making the graft grow, and the produce of the vine was white and black fruit on the same bunch.

Repulsion.—Steel and Water.

Dr. Dalton, in his philosophical experiments, says, "if a blade of a well polished knife be dipped into a basin of cold water, the particles of each of those two bodies do not seem to come in contact with each other; for when the blade is taken out, the water slides off, leaving the blade quite dry, as if it had previously been smeared with any greasy substance.

In the same way, if a common sewing needle be laid horizontally on a glass of water, it will not sink, but form a kind of trench on the surface on which it lies and floats about. This proceeds from the little attraction which exists between the cold water and the polished steel. It is necessary that both the knife, in the last experiment, and also the needle, should be dry and clean; otherwise, the effect will not be produced.

LITERARY NOTICES.

Holden's Dollar Magazine for April, has made its appearance. It contains a portrait of Washington Irving and his "Sunny Side" on the banks of the Hudson. A view on the river Stour in England, and the scene of an encampment in the Sacramento valley, which we imagine will be verified to the sorrow of some of the participants; the artist has executed faithfully our idea of being far away from "Home Sweet Home." Holden is cheap at a dollar.

Neal's Gazette, published in Philadelphia, has been considerably enlarged and makes a beautiful appearance. It is an excellent paper.