

Ozone as a Disinfectant.

Get a wide-necked bottle and put in half a pint of water, with a cork floating at the top; on this cork fix a bit of phosphorus; cover the bottle with another bit of cork very loosely. This apparatus may be moved from room to room, remaining till the characteristic smell of ozone is perceived.

Sharpening Files.

J. S. C. of New York City, says that when files become clogged and dulled they should be bathed in strong potash water to remove all grease, and then immersed endwise in a jar of one gallon soft water, two ounces tartaric acid and half a pint of sulphuric acid. Let them remain a few hours, remove them and after washing in clear water put a little oil on the teeth. A second immersion in the acid before oiling and after washing is sometimes an advantage. The acid etches the teeth, or rather the interstices, and sharpens the file. We have heard of this before, but have never tried it.—*Scientific American*.

Alloys of Steel with Platinum.

Are said to be very perfect in every proportion that has been tried. The best proportion for edge instruments is about 1.5 per cent of the latter metal. Equal parts by weight form a beautiful alloy which takes a fine polish and does not tarnish; the color is the finest imaginable for a mirror.

Golden Color Alloy.

An alloy which exhibits a yellow golden color, is readily forged like iron, and easily worked by the file, consists of 4.06 parts iron, 55.33 parts copper, and 41.8 parts zinc.

Hard Cast Iron.

Extremely Hard Cast Iron has been made by M. Gaudin by introducing a small quantity of boron, and lately, by combining the fused iron with phosphate of iron and peroxide of manganese.

To Remove the Taste from New Wood.

A new keg, churn, bucket, or other wooden vessel will generally communicate a disagreeable odor to anything that is put into it. To prevent this inconvenience, first scald the vessel with boiling water, letting the water remain in it till cold. Then dissolve some pearlsh or soda in lukewarm water, adding a little bit of lime to it, and wash the inside of the vessel well with the solution. Afterwards scald it well with plain hot water, and rinse it with cold water before you use it.

Worm Eaten Wood.

Worm eaten wood may be saved from further ravages by fumigating it with benzine, whereby the worm is destroyed. Another way is to saturate the wood with a strong solution of corrosive sublimate—a process which may be advantageously employed to protect carvings in wood. But as sublimate destroys its color, it will be necessary to restore the latter by ammonia, and then by a very dilute solution of hydro-chloric acid. The holes

made by the worm may then be ejected with gum and gelatine; and a varnish of resin, dissolved by spirits of wine, should afterwards be applied to the surface.

The Engineer's Alphabet.

First obtain a fair familiarity with the mode of working out all ordinary arithmetical questions, and also a knowledge of algebra as far as simple equations. Learn also the elementary problems in mensuration, and how to measure heights and distances, and how to level and survey land.

Next gain some general knowledge of the principles of chemistry and of geology, and of the qualities of stones and cements, the action of the tides, the force of the winds, and the amount of rainfall.

Next obtain a thorough familiarity with the strength of materials, and acquire a distinct apprehension of the laws of virtual velocities and of the conservation of force.

The law of virtual velocities enables the strain placed upon any part of a machine or structure to be immediately computed when we know the weight or force applied to any other part, and by this expedient, joined to a previous knowledge of the strength of materials, it can easily be determined whether any machine or structure is strong enough. Thus in a crane, if the interposed gearing is such that the travel of the handle through 100 in. will cause a tooth of a certain wheel to move through 1 in. then we know that the strain upon that tooth will be 100 times greater than the force applied to the handle, and so in all other proportions. So, also, in a beam or girder of iron of which the top flange is incompressible, if we wish to determine the breaking strain acting upon the bottom flange when the beam is loaded in the middle, we have only to suppose that the beam has been broken, and if we find that the broken edges separate only 1 in. while the weight falls through 6 in., then the strain at the edge of the beam seeking to sever it is six times greater than the weight.

The law of the conservation of force teaches that a force once existing cannot disappear except in the creation of some equivalent force, and one corollary of this law is that no form of mechanism can create power. Hence in a steam engine, if the steam were to be condensed by a jet of cold water immediately as it issued from the boiler a certain volume of hot water would be produced. But if the same steam be allowed to flow through the engine, and be finally condensed in the condenser, the resulting volume of hot water will be less in proportion of the power exerted by the engine. Heat being a form of power, it follows that if a certain portion of it goes to generate mechanical power in the engine, there is less to expend in raising the temperature of the water by which the steam is condensed.—*Engineering*

Fireman's Protector.

A fireman's protector, recently tested in Quebec, consists of a finely perforated brass ball attached to the nozzle about where it joins the hose, so as to present itself toward the fireman, when playing upon the fire, and to throw over him a heavy spray of water as a protector from the heat.