Hermetic Barrels.

A correspondent of the *Scientific American* writes:—"There is a description of a hermetic barrel on page 288, current volume of the *Scientific American*. There is also a reference to said barrel on page 292. Barrels intended to contain refined oil and spirits, are invariably glued on the inside, and, in most cases, painted on the outside. This is a hermetical package, but owing to shrinkage of the wood the glue cracks at the joints, and leakage is the consequence. I have known for some time that a perfect hermetical barrel is possible. The impermeability of the wood is accomplished by having the annular layers concentric in the package as they are in the tree. Our present mode of getting out staves is radial with the trunk of the tree, thus cutting the annular rings in lengths equal to the thickness of the staves, thereby exposing the cellulose portion of the wood to the percolation of fluids, that not only pass through the open pores, but dissolve the mucilaginous matters contained in those that are closed. By getting out the staves trangential to the circles of annular growth, the thickness of the staves would admit of quite a number of layers, the capillaries of which could be filled with water and the ends sealed up, thus preventing shrinkage, preventing percolation, and producing, beyond a doubt, an hermetically sealed package. This mode of getting out staves has another advantage. It is well known that old barrels are tighter than new ones, arising from the fact that the gummy matters having been dissolved, the cellular layers collapse under pressure of the hoops, bringing the ligneous layers closer. But what the barrel has gained in "seasoning" it has lost in durability. The wood being saturated with oil becomes as brittle as if it was dazed. By preventing the absorption of oil, the wood will retain its fibrous toughness; and if it be true that the lower ligneous layer must be pressed against the upper ligneous layer, to act as a fulcrum to break it on, we will be less troubled with broken staves, with their leakage and loss."

Boiler Explosions.

It may be well (says the *Mechanics' Magazine,*) to place the following paragraph on record. Negligence is too often the cause of boiler explosions:—"One of the enginemen engaged at Gospel Oak Colliery, Tipton, was sent to prison on Friday, for placing in jeopardy the lives of about sixty miners. He had neglected to examine the boiler as he ought to have done, and early on Friday morning, when about sixty miners were waiting to go down the pit, the boiler plates were seen to be red hot, and it was, as it is described, almost a miracle that no explosion took place."

Petroleum as Fuel.

In a recent number of this Journal (Nov. 1864) we inserted an article from the grocer, on Richardson's invention for using Petroleum instead of coal as fuel for raising steam. More recently an elementary course of experiments was commenced in the factory department of Woolwich dockyard, with a view of testing the capacity of petroleum to supersede coal and other fuel on ship board, and also in propelling steam machinery in the factories. The method adopted is the patented invention of Mr. C. J. Richardson, an engineer residing at Kensington. The plan under trial is simply to burn the petroleum through a porous material, which is placed in an iron chamber, dipped into a water vessel also of iron. The oil admitted into the chamber soddens the porous material, and rises by a sort of capillary attraction. The surface then catches fire and burns rapidly, as long as the oil is supplied. The effect of the flame is so great that with the small apparatus, which is only two feet superficial area, and affixed to a boiler, the oil on Saturday was utilised so as to be equal for steam purposes to five tons of coals. A third advantage is obtained by the employment of the petroleum—namely, that no stokers are needed, and the boilers can be supplied with several fires one above another. The small grate used in the experiments was placed under a boiler of 17-horse power, and in two hours it raised the steam to 10lb. pressure. The only objection seems to be the fear of explosive qualities, but these Mr. Richardson states he is prepared to guard against effectually.

A New Match.

A lucifer match is now in the market that differs from anything hitherto in existence. Upon the side of each box is a chemically-prepared piece of friction-paper. When struck upon this, the match instantly ignites; when struck upon anything else whatever, it obstinately refuses to flame. You may lay it upon a red-hot stove, and the wood of the match will calcine before the end of it ignites. Friction upon anything else than this prepared pasteboard has no effect upon it. The invention is an English one, and, by special act of Parliament, the use of any other matches than these is not permitted in any public buildings. The discovery is a curious one. There is not a particle of sulphur in the composition of the lucifers in question.

Practical Memoranda.

Comparative Strength of Liquors.

Dr. Jones, physican of St. George's Hospital, London, in a recent lecture, stated that the different fermented liquids which he had examined might, in regard to their strength or stimulating power, be thus arranged:—

Cider	100	Champagne	241
Porter	109	Maderia	325
Stout	133	Marsala	341
Ale	141	Port	358
Moselle	158	Sherry	358
Claret	166	Geneva	811
Burgundy	191	Brandy	986
Hock	191	Rum	1243

Thus ten glasses of porter, six glasses of claret, five of Burgundy, four of Champagne, three of sherry, are equivalent to one glass of brandy, or three-quarters of a glass of rum. The reader must always bear in mind, however, that of the large amount of brandy, so-called, sold in liquor shops, but very little is pure brandy.