

Safety Friction Match.

The following is a condensed description of a mode of making safety friction matches, for which a patent has been obtained by M. Mearing, London.

The wooden splints are first dipped into melted sulphur, and then coated with this mixture;—Chlorate of potash, eight parts; sulphur, one part; rotten stone, four parts; gum, two parts; and lamp-black one part; all mixed in a sufficient quantity of water to form a paste. After being dipped they are then dried, but will not ignite until rubbed upon paper made as follows;—Take amorphous phosphorus, four parts; powdered graphite, one part; and form a paste with these in four parts of water and one of silicate of soda. This when dried is the paper upon which the matches prepared as described are to be rubbed.

New Kind of Leather.

A short process of treating hides, with the use of very little tan bark, to make leather, has been patented by H. C. Jennings, London. In the preparation of thick ox-hides by this process, the hair is first removed in the usual manner, either by steeping them in lime baths, as in the old mode, or by sweating, according to the common American method. If lime is used, the hides are steeped in diluted muriatic acid, after they are unhaired and washed. This opens their pores and fits them for the succeeding operations. They are now piled in batches of a dozen hides in each, with a hurdle of wicker between each pair; and they are then alternately lowered into tanks filled with the following solutions;—Tank No. 1 is charged with a strong solution of alum, to which ten per cent, each of sulphuric and muriatic acids are added. Tank No. 2 is charged with a concentrated solution of soda-ash (carbonate of soda) to which is added five per cent. of the tungstate of soda. The skins or hides are immersed for six hours at a time in these tanks, then withdrawn and drained, and transferred alternately from the first to the second, and *vice versa*, until the hide is sufficiently hardened. This condition of the hide is known by cutting a small piece off one with a knife. At this stage they are immersed for six hours in a strong solution of tungstate of soda, alone; then lifted, drained and placed in a liquor of soap, made by dissolving 20lbs of soap in every ten gallons of water, and the hides agitated in this until the strength of the soap is exhausted by being absorbed in the hides. They are then washed well in soft water, and finally steeped for twenty-four hours in a common liquor of oak-bark, after which they are dried and finished in the usual manner.—*Scientific American*.

Paper for Backing Iron Plates

Hard wood has been used to support the armour of all the iron-clad ships hitherto constructed; but an impression prevails that a tougher and more unyielding substance might be advantageously substituted for it. Strange to say, paper has been thought to possess those properties, and in the form of millboard was tried at Shoeburyness in competition with wood. The presumption from the experiment is that paper has the advantage over hard wood.

A New Silk-Worm.

According to advices from the River Plate, an important item of commerce is about to be added to the resources of Monte Video. Eighty specimens of a hardy description of silk worm, *Gusano Recino*, were introduced into that country about eight months ago, and it is affirmed that at the present time they are counted in millions, being the produce of five generations in this short period. The plant upon which the worms feed grows spontaneously in the republic, and it is said to be of such fine quality and so appropriate for their food that the cocoons present a consistency and weight superior to those produced in Europe, or even in China. Specimens are expected in England by the next mail. The silkworms, it is added, have passed through an unusually severe winter, which they resisted without suffering the losses that occur with the China worm.—*London Express*.

Cement for Clay Retorts.

The cracks and leaks in clay retorts can be filled by the following cement:—

Fire-clay.....	42.5 per cent.
Loam-sand.....	42.5 “ “
Glass.....	10.0 “ “
Chloride of Sodium.....	5.0 “ “

100.00 “ “

The compound is ground well together with water, and applied as a lute.

New Iron Cased Vessels.

At the present moment no less than five iron-cased vessels, of the largest and most formidable class are being constructed. First and largest comes the *Minotaur*, an enlarged and improved *Warrior*, and building on the same slip from which that frigate—the first contribution to the reconstruction of the British Navy, and finest ship of war in the world—was launched. The *Minotaur* is 400ft. long, 59ft. 4in. broad, and nearly 7000 tons burden. She will be protected from stem to stern, differing in this respect from the *Warrior* (which only carries her armour amidships), and will be defended by 9in. of teak and armour plates of 5½in. thick, an inch thicker than those of the *Warrior*. A company are also building for the British Admiralty another iron-cased frigate, the *Valiant*, of 4100 tons burden, which will be launched in the spring of next year. Her protecting armour is similar to that of the *Warrior*, viz., 18in. of teak and 4½in. armour plates. In an advanced state of progress is also a floating battery for the Russian Government, 220ft. in length, 53ft. broad and 2800 tons, also protected by 4½in. armour plates on 9in. of teak, and intended to carry 26 68-pounder guns on a draught of 14 ft. The frames are also beginning to be erected of a frigate which a company have just undertaken to build for the Spanish Government, of about 5000 tons, with 5½ in. armour plates; and the slip is also being prepared for a similar frigate of 4300 tons for the Turkish Government, making altogether nearly 23,000 tons of iron-cased shipping under construction by one firm, which together constitute a formidable fleet superior to what is possessed by any but the first-rate naval powers.—*Mech. Mag.*