ers cannot be said to have satisfied the hopes with which it was originally introduced for this purpose. Copper is now wholly out of the question, nor were it abundant and cheap would its strength be reckoned sufficient. No material applicable to boilers is less liable to corrosion than cast-iron. Wherever great heat has to be borne, its resisting powers make it second only to platinum among the metals. For heating stoves for blast fur-naces, and indeed for domestic stoves, wroughtiron is entirely unfit. For gas retorts it is of course worthless, while cast-iron, until the introduction of the most refractory clay retorts, was considered to serve a very good purpose. For superheaters it is quite superior to wrought-iron in any form. The Peninsular and Oriental Company have, indeed, long since abandoned wrought-iron for copper superheaters, but equally good, if not better, results are obtained by Messrs. Richardson & Sons from Mr. Jaffrey's cast iron superheaters. The motive for the use of cast-iron in heating stoves, gas retorts, and superheaters, is economy; but in the case of steam-boilers, where the principal source of danger has been found to be in corrosion. the use of cast-iron (with a large margin of strength to resist bursting) appears to be essential to safety. The highest required tensile strength is now given to cast iron boilers-their bursting pressure being from 1,500 lbs. to 2,000 lbs. per square inch, while it appears reasonable to consider them as entirely secure from the common danger of corrosion .-London Engineer.

Parchment.

Parchment is made of skins of sheep and lambs, though that kind which is used for the head of drums is said to be made of goat-skins. Vellum is a finer, smoother, white kind of parchment, made of the skin of young calves. The mode of preparation is first to take off the hair or wool, then to steep the skin in lime, and afterwards to stretch it very firmly on a wooden frame. When thus fixed, it is scraped with a blunt iron tool, and wetted and rubbed with chalk and pumice-stone till it is fit for use.

Prevention of Rust in Iron.

Many a valuable hint is to be obtained from an intelligent practical laboring man, which may lead the philosopher into a train of ideas that may, perhaps, result in discoveries or inventions of great importance. When bricklayers leave off work for a day or two, as from Saturday to Monday, they push their trowel in and out of the moist mortar, so that the bright steel may be smeared all over with a film of it, and find this plan an effectual remedy against rust. In Wren's "Parentalia" there is a passage bearing upon this subject :---"In taking out iron cramps and ties from stone. work, at least 400 years old, which were so bedded in mortar that all air was perfectly excluded, the iron appeared as fresh as from the forge. Oxygen, which is the main cause of rust, is abundant in the composition of both water and the atmosphere; and that quicklime has an astonishing affinity for it is evinced in the homely practice of preserving polished steel or iron goods, such as fire-irons, fenders, and the fronts of "bright stoves," when not in use, by shaking a little powdered lime

on them out of a muslin bag, which is found sufficient to prevent their rusting. Another instance, very different and far more delicate, bearing upon the same principles; the manufacturers of needles, watch-springs, cutlery, etc., generally introduce a small packet of quicklime into the same box or parcel with polished steel goods, as security from rust, before sending it to a distant customer, or stowing it away for future use. These cases are extremely curious, because, as a general rule, bright steel or iron has a most powerful affinity for oxygen; consequently it is very readily acted upon by damp, and is rusted in a short time, either by decomposing the water and obtaining oxygen from that source, or direct from the atmosphere. It is not absolutely essential that the quicklime should be in actual contact with the metal, but if somewhere near, as in the case of the parcel of lime packed up with the needles or watchsprings, the bright metal will remain a long while without the least alteration in its appearance; the lime (which is already an oxyd of calcium) either receiving an additional dose of oxygen or being converted into a carbonate of lime.-Builder.

A Miniature Steam Engine.

We recently had the pleasure of seeing a miniature working model of a pair of Penn's patent trunk engines, made by Mr. Thomas Smith, modeller, of 20, Walnut-tree Walk, Lambeth. These engines are facsimiles of those in H.M.S. "Warrior." The model engines, however, are intended to work at high pressure, whereas the "Warrior's" are condensing engines.

are condensing engines. The weight of the pair of model engines is two grains less than that of a silver three penny piece; and they stand on less space than a silver threepenny piece would cover. The cylinders are 2.32nd of an in. in diameter. Length of stroke 1-16th of an in. The throw of the eccencric is 1-60th of an in. The engines are constructed with the link-motion reversing gear. The hexagonheaded bolts used for fastening on the cylinder covers are 1-100th of an in. in diameter. The engines can be worked at from 20 revolutions per minute up to 20,000 revolutions per minute.— Mechanic's Magazine.

Increasing Application of Steel.

The Practical Mechanic's Journal says one cannot but notice the great change which the introduction of steel in the place of iron in many parts of mining machinery is likely to effect, as well in cheapening its cost as in rendering it more powerful and more enduring. Although the price of cast and hammered steel is double the price of iron of the same weight, yet the superior strength and endurance of the former enables the engineer to reduce the weight of his casting so considerably as to render the actual cost of s:eel machinery but little more than that of iron, whilst it is well known that it will last ten times as long and may be more implicitly trusted.

Oll-Lamp Furnace for fasing Metals at a White Heat.

Mr. Chas. Griffin, of London, proposes to fuse metals by means of a furnace heated by mineral oil. The combustion of a quart of this (which