JAPANESE ENGINEERS AND MECHANICS.

The skill and ingenuity of the natives of Japan, says an English exchange, have long been well known, and proof of these qualities is given by the aptitude which they display in learning the workings of railways and qualifying themselves to fill the more responsible of the subordinate positions. The Japanese, from whom for some time past all the station-masters and porters, as well as the plate-layers and artisans, had been drawn, have latterly been gradually replacing the English engine-drivers, and apparently with satisfactory results. The chief fault to be found with the native drivers is, seemingly, that they do not thoroughly understand the construction of the engines under their charge, but this is a matter which longer experience will rectify. There also appears to be a lack of presence of mind and watchfulness, and it is somewhat ludicrous to read of a driver starting with only half of his train in broad daylight, and not discovering the want of the other half until he had reached the next station. It is, therefore, not surprising that the strictest examination and supervision has to be kept on all engines under native drivers, in order to avoid any chances of failures or casualties. At the same time we are assured that very few mishaps have occurred —indeed, so far as misadventures with the locomotives are concerned, the Englishmen appear to have been quite as often at fault as their native fellows—while the increasing number of Japanese employed bears testimony to the confidence which is felt in their capabilities. In other capacities the native workmen display great skill, the carriage and wagon building, for instance, being carried on in a highly satisfactory manner by the Japanese foreman carpenter; and two engines, which had been transferred from one line to another, having been put together again and got ready for work by a native fitter, without any assistance from Europeans. The only complaint made against them is that they are somewhat slow. It is clear, however, that the Japanese are quite well enough qualified to carry on the workings of their railways; and, after the system has been completed, we should not be surprised to find that eventually they took the entire control into their own hands.

FIRE-PROOF INK.

It appears that the effort to manufacture a fire-proof paper and ink for either writing or printing purposes has recently met with success in Germany. Paper possessing fire-proof qualities was made with chemically-treated asbestos fiber ground or finely divided wood fiber. Ninety-five parts of asbestos was used with five parts of the wood fiber and by aid of glue water and borax were made into pulp, which yielded a fine, smooth paper, which could be used for writing purposes. It had the unusual quality of sustaining the influence of a white heat without injury. Fire-proof printing and writing inks were made by combining platinum chloride, oil of lavender and lampblack and varnish. These ingredients produced a printing ink, and when a writing fluid was wanted, Chinese or India ink and gum arabic were added to the mixture. Ten parts of the dry platinum chloride, twenty five parts of the oil of lavender and thirty of varnish are reported by a local writer to yield a good printing ink of this valuable kind when mixed with a small quantity of lampblack and varnish. When the paper printed with this compound is ignited the platinum salt is reduced to a metallic state and becomes a coating of a brownish-black color. A free-flowing ink for writing on the fire-proof paper with an ordinary metallic pen may be obtained by using five parts of the dry chloride of platinum with 15 parts of oil of lavender, 15 parts of Chinese ink, and one part of gum arabic, adding thereto 64 parts of water.

When the paper is ignited after being written upon with this ink, the platinum ingredient causes the writing to appear transparent, and, as a consequence, it is claimed that such writing as has become black or illegible will become rapidly legible again during the process of heating the paper. Colors for painting may also be made fire-proof by mixing commercial metallic colors with the chloride of platinum and painters' varnish, adding an ordinary aquarelle pigment to strengthen the "covering power" of the color. These fire-proof paints or colors can be easily used in the same manner as the common water colors, and it is claimed they will resist the destructive influence of great heat quite as successfully as the fire-proof printing and writing inks just referred to.—*Ex.*

A new steel manufacturing city will be created in the coal regions of southern Illinois.

HOW STEEL RAILS ARE MADE.

They run the steel into ingots about fifteen inches square and about five feet long, and then, while still hot, carry them to the mill, where they are put into a furnace until they get the required heat, and are then rolled into what are called blooms. These are seven inches square, and are cut, while still hot, with the shears, so that they will roll out into a rail of the required length. They are not allowed to get cold, but are again put into a furnace and reheated, and then run through a series of rolls in what is called a 21-inch mill. I inquired the meaning of this 21-inch, and was told that it meant the distance between the centers of the rolls. When the bloom passes through the last roll it is a finished rail, and runs on to a long carriage, where a saw at one end makes it just the right length. At the other end of the rail is what is called a cambering machine, to camber the rail. This was a new word to me, and I was told that camber means to bend and it did bend. It put a perfect curve in the rail the whole length of it; this is done so that it will cool straight. I was informed that, if the rail were straight when it was hot, it would be cambered when it was cold, so they camber it hot, and have it straightened cold. The rails are then run out of the works and loaded ready for shipment, so that from the time the ore is taken from the mine until it leaves the works all finished, it is never allowed to rest, and, when once hot, never gets cold until completed. The steel ingots especially are hurried off, for if they are allowed to cool they will crack. —*Mechanical Engineer.*

OIL FOR STORMS AT SEA.

Considerable discussion has recently occurred in the daily press regarding the effect of pouring oil upon the sea, at the time of a storm, for the purpose of lessening the action of the waves. It seems to be clearly established that oil thrown from a vessel into the ocean will lessen the effects of a storm. In October, 1861, the Port Royal expedition started from Fortress Monroe, under command of Dupont. A fearful storm was encountered off Hatteras, and it was thought that a small side-wheel steamer, called the "Vixen," could not possibly survive. But as the flag-ship approached the rendezvous off Port Royal she was seen quietly at anchor, having reached there among the first of the squadron. The commander, Mr. Platt, in relating the experiences of the storm to his chief, Mr. Boutelle, modestly recounted that, when the storm grew too heavy for him to keep his course, he had brought the vessel's head to the sea and had put out a drag to assist him in keeping her in that position. As the storm reached its height and the huge waves frothed and combed they began to break on board and the vessel was in great danger. He then poured about a gallon of oil overboard, just abaft the lee paddle-box. It drifted with the vessel and soon formed an oily scum about her, after which not a sea combed or broke on board, and she rode out the gale in safety, arriving at the appointed rendezvous in advance of many vessels of enormously greater power and speed. Mr. Boutelle immediately reported the circumstance to his official superior, Professor A. D. Bache, superintendent of the Coast Survey.

A WHITEWASH THAT WILL STICK AND WASH.—We find in a German paper a formula for a wash which can be applied to lime walls and afterwards become waterproof so as to bear washing. Resenschek, of Munich, mixes together the powder from three parts silicious rock (quartz), three parts broken marble and sandstone, also two parts of burned porcelain clay, with two parts freshly slaked lime, still warm. In this way a wash is made which forms a silicate if often wetted, and becomes after a time almost like stone. The four constituents mixed together give the ground color to which any pigment that can be used with lime is added. It is applied quite thickly to the wall or other surface, let dry one day, and the next day frequently covered with water, which makes it waterproof. This wash can be cleansed with water without losing any of its color; on the contrary, each time it gets harder, so that it can even be brushed, while its porosity makes it look soft. The wash or calcimine can be used for ordinary purposes as well as for the finest painting. A so-called fresco surface can be prepared with it in the dry way.—*Sci. American.*

The electric will effect the colors of cloths, as well as paintngs, in the same way but not so quickly as sunlight.