

it dries quickly, with a hard surface ; but if the air, from local causes, contains obnoxious gases, such as sulphuretted hydrogen gas, produced by the passage of trains, the red-lead will be quickly destroyed. J. Newman, author of "Corrosion and Fouling," says by letter of 21st January, 1897: "Probably the *worst* paint you can use for either iron or steel is ordinary lead and oil paint." Oil alone should not be used for priming in the shop ; it collects dirt and cinders ; besides, the pure oil dries, but never hardens. As it contains no pigment, it is quite porous and pervious to water ; the surface will consequently expand and present a shrivelled appearance and blisters will eventually appear.

For second-coat work, an elastic but firm surface is required to follow the expansion and contraction of the metal and resist the mechanical impact of strong dust or cinder-laden winds and rain, spray, hail and snow. In this coat more boiled oil, a less weighty pigment, and a less quantity of turpentine is required, so that it will dry more slowly and for a longer time resist the sun's influence, which is ever tending to harden and crack the surface and allow the entrance of water to the metal. A pigment, then, of low specific gravity must be used. Crude graphite ore powder has a specific gravity of about 0.7, and as graphite cannot be affected by chemical influences, it would seem to offer a suitable material for second-coat work. I have tested it for a period of one-and-a-half years, and so far it has done fairly well. Objections have been urged against it as follows :

- 1st. It is expensive to grind to a high degree of fineness, because of its oily and flaky character.
- 2nd. Because of its lightness, no great body of it can be got into the oil.
- 3rd. It settles out of the oil.

Some of these objections may be more imaginary than real.

A prominent manufacturer says that the composition of the best graphite now mined, ground and used for paint, is as follows :