

LOCOMOTIVES WITHOUT FIRE.

Machines on the above-named principle are now at work on the tramway from Ruail to Marly, near Paris, and with satisfactory results. The system in use is one introduced by M. Francy, an engineer, and is based on the fact that water boils at a lower temperature proportionately to the reduction of the atmospheric pressure. It is well known that water requires a temperature of 212° Fahr. to boil at the sea level; but at a higher altitude, or where the atmospheric pressure is reduced artificially, as in a partial vacuum, it boils and produces steam at a much lower temperature.

Acting upon this principle, M. Francy takes a reservoir of thin steel, we cannot call it a boiler, for it has neither fireplace nor fire, and introduces water at a temperature of 200° Fahr., and then covers up hermetically. The steam it gives off at once fills the superincumbent space, and produces a pressure of 15 atmospheres. As soon as any of the vapor is turned on for moving the machine the pressure is reduced, and the water then begins to boil, producing a fresh supply of steam. Of course that process is but of limited extent, as, at the commencement, the liquid only contained a certain amount of heat, which is gradually diminished as the reproduction of steam takes place at lower temperature by the exhaustion of the superincumbent pressure. So far a machine of this description would be obviously totally inadequate to any prolonged journey. But for short transits it has been found extremely serviceable. As the amount of pressure required to work the engine is only five atmospheres, a series of valves are so arranged as to prevent a greater amount of force issuing from the reservoir than is necessary, and thus retaining as far as possible the heat originally contained in the water. The driving part of the machinery is nearly identical with that of ordinary locomotives, with a few modifications, with the purpose of guarding against the useless waste of the heat originally introduced into the reservoir.—*Galvani's Messenger.*

THE AGE OF STEEL.

By the various cheapening processes which have of late years been introduced into the manufacture of steel, that article is fast supplanting the use of iron in the various industries, and notably so for railroad purposes. Bessemer steel rails are now produced nearly as cheap as iron. It now appears to be only a matter of time, and short at that, when Bessemer and Siemens-Martin steel will be so cheap that they will take the place of wrought-iron for almost every purpose. The latest new proposed use of steel is for tin plate makers, who, it is said, are about to abandon iron for that purpose.

The Bessemer steel trade, which had its origin in England rather more than 20 years ago, still continues to be followed more largely in that country than any other. Of about 2,000,000 tons of Bessemer steel now annually produced throughout the world, England furnishes 750,000 tons; the United States, 525,000 tons; France, 261,874 tons; and Germany, 242,251 tons. No industry in modern times has sprung up so suddenly into importance, nor has any other caused greater changes in the way of setting aside an old and introducing a new order. To this industry in supplanting the use of iron is due the fact that thousands of furnaces have been closed up and tens of thousands of workmen either thrown idle or transferred to other occupations. The age of iron has become the age of steel. A new departure, long threatened and greatly feared, has been actually accomplished.

The Post Office department has reduced the prices of stamped envelopes on an average 20%, the effect of which has been to largely increase the requisitions for the same.

INDIAN LETTUCE, OR WILD LETTUCE.

Indian Lettuce is very generally distributed along the Pacific coast. It is found throughout Washington Territory between the Cascade mountains and the sea, and extends at least as far south as San Francisco and its vicinity. Along our water courses in the mountains, and where they wind their tortuous ways through

PHOSPHORUS A CURE FOR SCIATICA.—It is not ordinarily wise to try remedies for effecting cures which one finds in the newspapers. But where the ingredients are such that no harm can arise from their trial, and the source from which the prescription emanates is likely to be reliable, the afflicted will gladly try almost any remedy recommended. Dr. Volquardsen reports in Schmidt's Dictionary and the Pests *Medico-Chirurg. Presse*, both good authorities, from:



INDIAN LETTUCE.

Sacramento, San Joaquin and Tulare valleys, and perhaps still further southward along the coast, it grows luxuriantly. It usually selects a moist, sandy loam, rich and well shaded, as its favorite haunt; but it will grow unprotected by shade on the poorest soils, and when once well-rooted, it is not easily destroyed.

SEVENTY-FOUR Communists in New Caledonia have been pardoned because of their services against the insurgents.

which the *London Medical Record* copies, a case of sciatica which lasted for two years and defied all treatment. He then arrived at the idea of trying the internal use of phosphorus, which he prescribed in doses of 15 milligrammes (about one-fourth of a grain) three times a day. Three days sufficed to obtain a marked improvement, and three weeks brought a complete cure.

FRANCE, watching Bismarck and Austria, has given one year's notice of the termination of all treaties of commerce.