

Waterproof and Fireproof Fabrics.

The *Textile Record*, which ought to be good authority on such subjects, says that the tungstate of soda is about the most serviceable substance for making fabrics fireproof. For use it is dissolved in five times its weight of lukewarm water. The solution is then mixed with a very small portion of phosphate of soda, and it is then ready to be used for saturating tissues. After being well steeped the goods are wrung out and dried at a gentle heat, and may then be ironed, etc., as usual. They will be found capable of resisting the action of the heat for a long time, and if ignited they merely smoulder without bursting into flame. For making fabrics waterproof, the following process, the editor of the same journal says, is highly recommended, but he has never observed its practical results: A composition is prepared with nitrate of potassium (saltpeter), 200 pounds; resin, 270 pounds; gum, 30 pounds; slaked lime, about 100 pounds.

"A milk of lime is first prepared, then the saltpeter is dissolved in water, and heated in a boiler, then so much lime is added that it does not become pasty, when the two other substances which have been fused on a slow fire are added. This composition can be left to cool, and being unalterable can be kept for use. To render tissue waterproof 100 pounds of this mixture are dissolved with one gallon of

increasing cost of labor. In according the prize to Mr. Serrell, the President of the Society, M. Rougier, one of the most eminent of French barristers, paid a high compliment to the genius and perseverance of the countryman of Benjamin Franklin. He said that France, in her appreciation of genius, knew no country or nationality. She resembled in this respect the great Republic of Washington, and she was ever happy to render to genius her merit, for science and art were universal.

IMPROVED REVERSING RAIL MILL ENGINES.

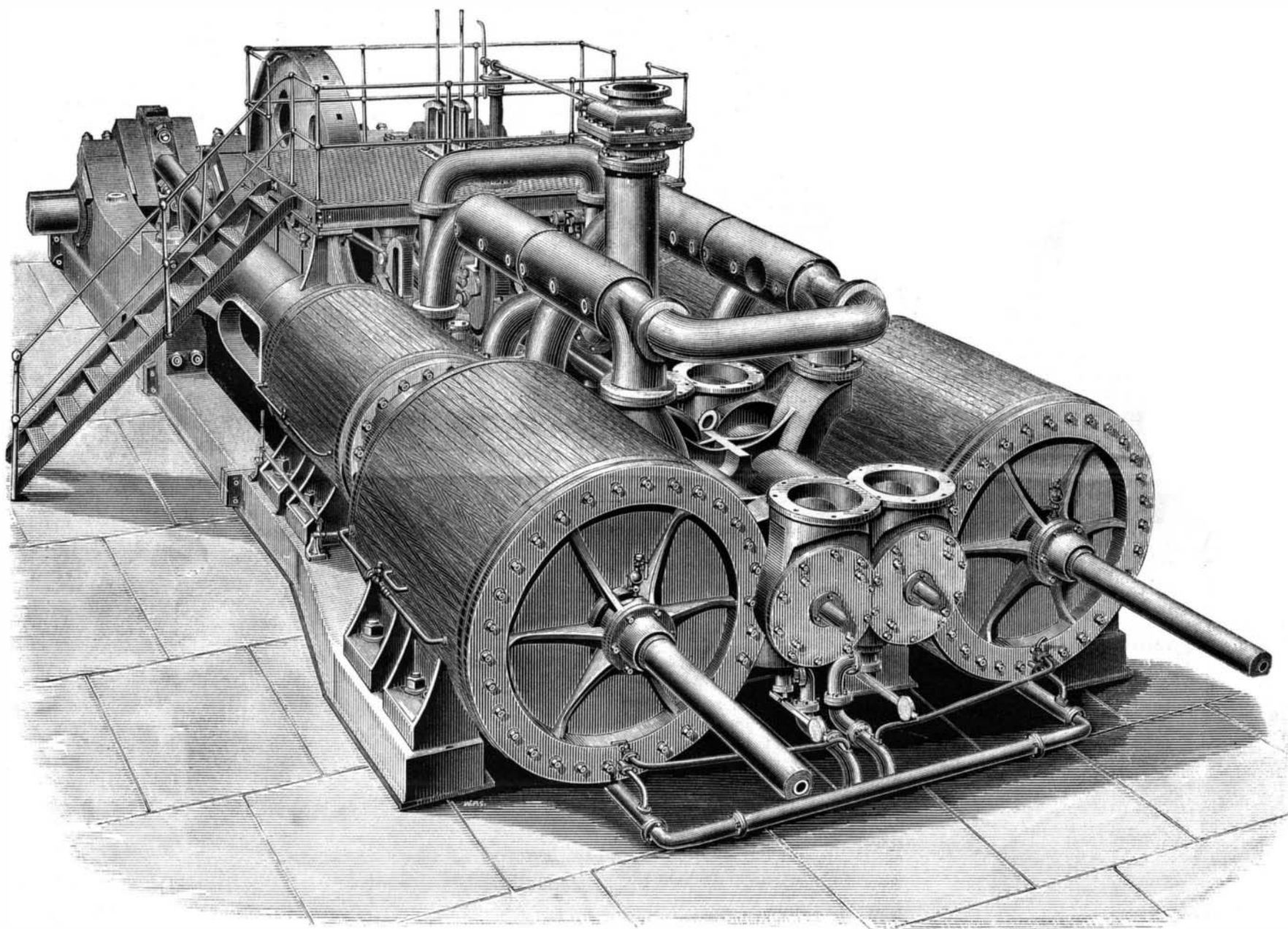
The engravings on this and another page illustrate by two perspective views a large pair of horizontal compound reversing rail mill engines, made by Messrs. Tannett, Walker & Co., of Leeds, for the works of MM. De Wendel et Cie, Hayange, Lorraine, and Joef, France.

The engines in question have two high pressure cylinders, each 34 inches in diameter, and two low pressure cylinders, each 60 inches in diameter, all having 5 feet stroke. The cylinders are steam jacketed, and provided with piston valves and link motions, the latter being worked by a hydraulic cylinder for reversing. The crank shaft, which is of the marine type, is made in two pieces bolted together, and weighs about 13 tons. The pins are 18 inches in diameter and 15 inches long, and there are four bearings, each 18

a siding in order to permit the express to pass. He accordingly put up all the signals against the light engine, but to his extreme astonishment the engine came straight into the junction at full speed, swept round the corner, dashing past all the danger signals, and disappeared from view down the line toward Chester. A moment's reflection convinced the signalman that both driver and stoker must be asleep. He accordingly wired to the Colwyn Bay Station signalman, "Engine coming; driver asleep; put fog signals on line." The man at Colwyn Bay was equally prompt, for, running out of his box, he had hardly time to lay a number when the engine came thundering along and an explosion followed, which effectually awoke the men. The engine was stopped and run back into a siding, when it was discovered that the fire had gone out, the water had disappeared from the boiler, and that the men had been asleep some time. Inquiry has resulted in their immediate discharge. They had been fifteen hours on duty.—*London Times*.

Waterproof and Other Special Paints and Varnishes.

The *Neueste Erfindungen* says that the waterproof preparation of G. Gebring, in Landsbut, is prepared by melting together 60 parts of paraffine, 15 parts of wax, and 30 parts of palmitate of alumina made by precipitating a solution of palm oil soap with alum. The stone, metal, or wood that

**IMPROVED REVERSING RAIL MILL ENGINES.**

boiling water, while on the other hand 10 pounds of alum are dissolved in 10 gallons of water. The fabric is first passed into the first solution, and then into the second, and finally dried between cylinders."

Honors to an American Engineer.

The Academie des Sciences, Belles-Lettres et Arts de Lyons, France, at its annual meeting on July 10, awarded the gold medal (founded by Prince Lebrun for the encouragement of useful inventions) to Mr. Ed. W. Serrell, Jr., of New York, for an automatic reel for silk. In a letter from Mr. Peixotto, published in the *SCIENTIFIC AMERICAN*, issue of June 10, 1882, on the silk industry of France, allusion is made to Mr. Serrell's invention. The writer at that time said he had great hopes that Mr. Serrell's automatic reel would prove successful, and that the invention was creating a great deal of interest among the silk growers and silk manufacturers in the south of France.

This discovery, according to experts, says the *Continental Gazette*, Paris, is destined to work the same revolution in the silk world as was wrought ninety years ago by the invention of the cotton gin. Cotton before then went to waste on the fields, and by the proletarian labor of Europe, and particularly of the Orient, the reeling of silk from the cocoon is until now an impossibility in the United States, and is rapidly becoming so in Europe, owing to the increased and

inches in diameter and 23 inches long. The connecting rods are 13 feet 6 inches centers. The engines are constructed to work at a pressure of 90 pounds to 100 pounds per square inch, and deliver their exhaust steam to a surface condenser, fitted with brass tubes three-fourths of an inch in internal diameter. This condenser also serves to condense the steam of the accessory engines, always to be found in a rail making plant, and is provided with an independent pair of horizontal engines, with cylinders 16 inches in diameter by 30 inches stroke, which work two double acting circulating pumps. We are indebted to *Engineering* for the illustrations and particulars.

Engineer and Fireman Both Asleep.

The occurrence on the Holyhead line of the driver and stoker of a train falling asleep while on duty and the extraordinary escape of the Irish mail last week was even more serious than reported. It would appear from inquiries made on Monday at Llandudno Junction by our correspondent that the signalman there, by extraordinary presence of mind, saved the Irish mail passengers on Tuesday night from what might have proved a terrible fate. The signalman at the junction received a message from the signalman at Conway, the next station toward Holyhead, that a light engine was coming. The junction signalman, knowing that the Irish mail was due, decided to run the engine into

is to be waterproofed is warmed to 140° or 200° Fah., and then coated with the melted mixture. For fabrics he employs a mixture of 60 parts of paraffine, 20 parts of palmitate of aluminum, and 10 to 15 parts of yellow wax dissolved in linseed varnish, to which is added from 6 to 15 parts of oil of turpentine.

A. Riegelmann, in Hanau, has patented a rust protector which consists of ordinary oil paint mixed with 10 per cent of burned magnesia, baryta, or strontia, as well as mineral oil. This neutralizes the free acid of the paint, and the alkaline reaction protects the iron from rust.

To prevent iron from rusting in the ground it is painted over with a mixture of 100 parts of resin, 25 parts of gutta-percha, 50 parts of paraffine, and 20 parts of magnesia, besides mineral oil. A temporary paint for the movable parts of machinery contains 20 or 30 per cent of magnesia or burnt dolomite, with some vaseline added to prevent drying.

THE Suez Canal Company intend adopting the Pintsch system for lighting the entrance to the canal; and with this view have ordered eight 9-foot spherical gas buoys, each to burn for two months, three fixed lights to burn two months, and three large holders for storing gas and filling the buoys, together with a small gas works to be erected at Port Said. It is proposed to extend the system to other parts of the canal.