

school of design and modelling in the world, rules all France in matters of taste, and sets the fashions of the whole world. There is no such centralization of the artistic and industrial movement of Germany. The exportation from France to the Zollverein in 1865, when the treaty first came into force, amounts to 133,500,000 francs, and the importations from the Zollverein to only 18,500,000. This last figure is, however, double the amount of the preceeding year. The Zollverein possesses in Saxony, Erzgebirge, Silesia, in the Hartz district—which is in the middle of Hanover—in Nassau, the two Hesses, in Thuringia, in part of Bavaria, and several other districts of Bavaria, Wirtemberg, and Baden, rich mines of coal, iron, zinc, tin, lead, and silver. Rock salt and salt springs also abound. The only countries with no mineral wealth are the duchies of Nassau, Oldenburg, and Luxemburg. For more than a century a celebrated mining academy has existed in the environs of Freiberg, in Erzgebirge. The extraction of silver in that district and the Hartz had much more importance in the middle ages than in the present day. The other metallic industries in great part date from the creation of the Zollverein, and the progress has been amazing.

The Prussian Minister of Commerce made for the Paris Exhibition a very curious collection of specimens of the produce of all the mines of the monarchy. It is accompanied by a scientific and explanatory catalogue prepared under the auspices of the chief of the department. Fifteen years ago the Zollverein only produced 150,000 tons of pig-iron, while France produced 400,000 to 500,000; Belgium, 200,000; Austria, 100,000; and Great Britain alone, 1,500,000, or more than all the rest of Europe put together. At present Westphalia produces more steel than England. The general production of smelted iron has been enormously increased. Germany still imports 1,500,000 tons of coal from England, chiefly for consumption in the ports and for steam navigation; but on the other hand, the Zollverein has raised its exportation of coal from 273,000 to 2,500,000 tons. A few years ago inferior in production to France and Belgium, the Zollverein now exports coal to an amount double that of those two countries, and nearly one-fourth of the exportation of Great Britain.—*London Gas Light Journal*.

Machinery and Manufactures.

A Race of Road Locomotives.

On Monday morning, August 26, in accordance with a previous arrangement, two road steam carriages—one made by Mr. Isaac W. Boulton, of Ashton-under-Lyne, having only one 4½ inch cylinder, 9 inches stroke, the other, made by Messrs. Daniel Adamson & Co., of Newton Moor, having two cylinders 6 inches diameter, 10 inches stroke—started from Ashton-under Lyne at 4 30 A.M. for the show ground at Old Trafford, a distance of over eight miles. The larger engine, made by Messrs. Adamson & Co., is a very well-constructed engine, and had a good quarter of a mile start of the smaller machine. The little one, with five

passengers upon it, passed the other in the first mile, and kept a good lead of it all the way, arriving at Old Trafford under the hour, having to go steady through Manchester. The engine made by Mr. Boulton ran the first four miles in sixteen minutes. The running of both engines is considered very good. On arrival at Old Trafford they tested their turning qualities, and both engines turned complete circles of 27 feet diameter, both to right and left, frequently.—*The Engineer*.

Silver's Self-lubricating Packing.

Mr. T. Silver, the American engineer, whose name has been so long connected with his well-known form of marine governor, is now engaged in introducing into England a remarkably original kind of packing for piston-rods. It works entirely without oil, being apparently self-lubricating, though we should say that its lubricating action is possibly aided by the presence of condensed steam. The packing put into the stuffing-box in the ordinary way, simply consists of a plaited cotton basket made up with a composition principally consisting of soapstone.—*American Artizan*.

Wet and Dry Lubricants.

Wet and dry lubricants are each said to be attracting much attention in Europe. The water-box of the French inventor vies with the dry, impalpable plumbago powder of the Battersea Plumbago Crucible Company; both being reported as giving results decidedly superior to oil, under comparative tests. The plumbago powder is said to adhere to the surface of the metal, perfectly filling the finest inequalities.

A New Mode of Horse-shoeing.

A great change is about to take place in the mode of horse-shoeing in Paris, it having long been understood that the method in present use is extremely defective. A man named Charlier has had the idea of altogether disembarassing the hoof of the awkward appendage of a shoe, which not only impedes the movements, but also deprives the animal of a certain amount of steadiness and elasticity. Charlier does not cut the hoof, but leaves it just as nature forms it. He merely protects it from violent blows and accidents, and against the wear and tear of the Paris pavement, by inclosing it in a thin circle of iron, which wards it from danger without compressing it. In this way the horse stands upon a healthy member instead of upon one which is constantly wounded by the iron and knife of the smith. Not only does this simple invention spare much time and money, but also acts as a preventive against the various diseases of the foot.

English Steam Fire-engines in France.

The people of Lyons were much astonished last week at seeing a steam fire-engine running in their streets. The engine in question, is, we believe, the first English one supplied to a French town. It has been made by Messrs. Merryweather & Sons, of London, to the order of the Préfet of the Rhone, for the town of Lyons, and is similar to one of the engines, "Le Prince Imperial," which has gained