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RAIL-ROAD NEWS.

Western Railroads.

The Economist (Cannelton, Ind.) has an excellent article on Western improvements and Railroads. The following table will show that, in the course of three years at farthest, 8,399 miles of railroad will be in operation in the West and some of the new States.

	No. of roads.	Miles in operation.	Miles constr'g.	Cost of constructing.
Texas,	1	—	72	
Tennessee,	5	30	602	$600,000
Kentucky,	7	77	518	1,500,000
Ohio,	30	690	1697	12,768,793
Michigan,	4	432	33	8,460,340
Indiana,	20	279	1142	5,100,000
Illinois,	16	119	1772	2,960,000
Missouri,	2	—	500	——
Iowa,	1	—	180	——
Wisconsin,	1	20	236	4,000,000
	87	1647	6752	$35,389,133

The Southern and Western States will undoubtedly profit more by railroads than the Eastern States, owing to their greater extent of territory, and, as a general thing, the extensive plains through which they pass, which require but few embankments or cuttings. We hope our Southern and Western States are also pushing along plank roads: these roads are essential to our farmers, as auxiliaries to the railroads.

Coal-Burning Locomotives.

Mr. Dimpfel's Anthracite Coal-Burning Locomotive, which had been in active use for one year on the Reading Railroad has been bought by the Utica and Schenectady Railroad, in this State. It is stated that it has fully overcome all obstacles in the way of burning anthracite coal, and has greatly reduced the cost in fuel. This engine we described in our fifth volume, page 405. A year's steady use seems not to have affected the tubes of the boiler. The attention of steamship owners may profitably, we think, be directed to the improvement of Mr. Dimpfel, and that of Mr. Mulholland. If these improvements only reduce the cost of fuel 7 per cent., the saving is very great for our Atlantic steamers—the longer the voyages the greater the advantages of economy in fuel.

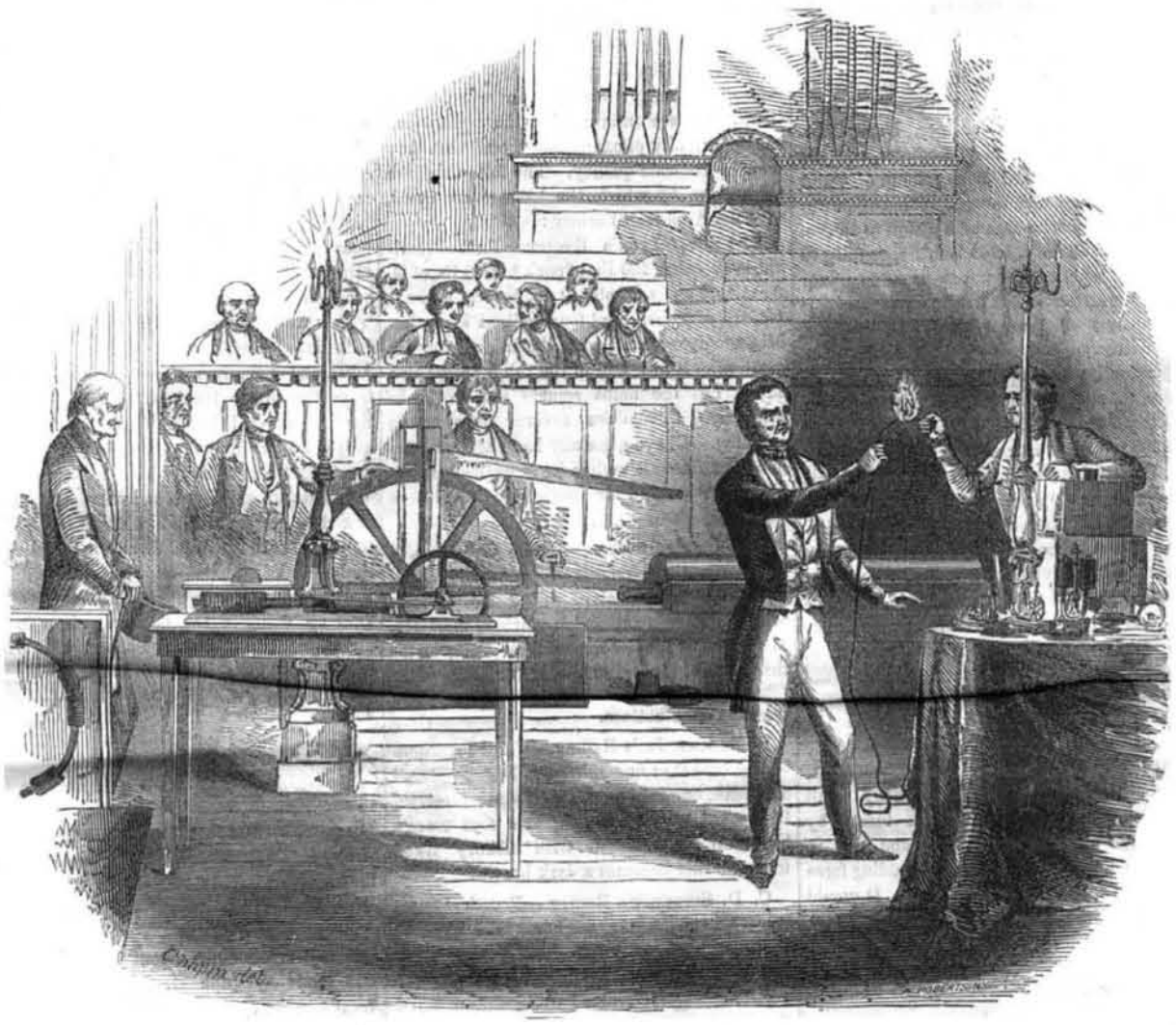
Vermont Central Railroad.

This road is being built from Bennington to Rutland, a distance of 55 miles, the grading and bridging are to be finished by the first of next December. The rails are being laid from Rutland, south, and about 17 miles are now ready for the cars. A branch from Eagle Bridge, N. Y., is building to intersect at North Bennington, Vt. This will make a direct line of railway from New York City to Rouse's Point and the Canadas.

Accident to the Africa.

The Canada and Baltic arrived here last Sunday morning, from Liverpool. The Canada came out in place of the Africa, which ran ashore in a fog near the Belfast Loch, in Ireland. The Africa returned to Liverpool not greatly damaged.

ELECTRO-MAGNETISM AS A MOTIVE POWER.---Fig. 1.



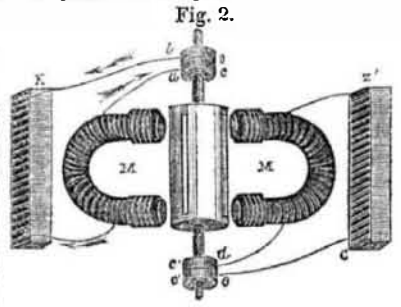
As noticed by us last week, we proceed to give the substance of Dr. Page's Lecture on his Electro Magnetic Engine, and also give a succint history of the applications of this power. We here present Prof. Page, as he appeared in the Tabernacle explaining his engine, and going over his experiments. His assistant is A. Davis, an electric engineer, and the brother of D. Davis, of Boston, so well known for his electric instruments. A number of lectures have been delivered in both the Tabernacle and Society Library, and the audiences have been of the most intellectual and scientific quality. They have given great satisfaction, both on account of their nature and the unassuming manner of the lecturer.

When he (Prof. Page) took up the subject of applying electro magnetism as a motive power, he found that all which had been done, was based upon the attractive and repulsive properties of electro magnets. An electro magnet consists, in an insulated wire, coiled round a bar of soft iron, with its ends open, and connected with a galvanic battery. When the circuit of the battery—the wire that connects the two last plates of it together, is closed, the end of the soft iron bar, which before was powerless, acquires a mysterious power, and will attract a mass of iron with great force to it. This will not produce a motive power, it is static force, but when the circuit of wire is broken, the virtue of the magnet ceases, and the attracted metal falls.

The first engine for producing motive power by electro-magnetism, was invented by Prof. Henry, now of the Smithsonian Institute. In 1833 with a battery contained in one cubic foot of space, sustained a weight of more than 3,000 pounds; and he constructed a machine to move machinery, which is described in Vol. 20, Silliman's Journal. The electro magnet has two poles, the positive and negative, and the two similar poles of two magnets repel one another. Prof. Page found that all the old electro magnetic engines were constructed on the principles of attraction and repulsion to produce motion. It is known that Davenport in our own country, Jacobi in Russia, and Davidson in Scotland made, some years ago, electro magnetic engines of considerable size; Jacobi propelled a boat on the Neva, in 1839; Davenport and Ransom Cook had quite respectable engines working in this city in 1840, and Davidson ran a locomotive, in 1842 on a railroad near the city of Glasgow, Scotland.

The engine of Jacobi was about two horse-power, that of Davidson propelled the locomotive, weighing five tons, at the rate of four miles per hour. It was equivalent to a little over one horse power, but Davidson used the attractive power alone, of the electro magnet, as is represented in fig. 2.

Fig. 2.



The axle we will suppose to be one of the locomotives, with the wheels removed, and the magnets, M M, we will suppose to be firmly fixed on the truck of the engine. We will suppose the batteries to be fixed at each end of the truck, and now, if we had two axles and four wheels, we should have the locomotive, but figure 2 will explain the principle of action much better. On the axle is a cylinder of wood, on which are secured three masses of iron at equal distances apart, and running the whole length. When one electro magnet is charged it will attract one mass of metal to it, and thus make the axle move on its axis partly round, then this magnet has its circuit broken, and the opposite magnet charged, which attracts the opposite mass of iron on the cylinder, and thus rotary motion is given to the axle and the wheels are revolved.

Near each end of the axle are two small cylinders, each one of which has the half of its rim next the large cylinder, covered with metal; the outer halves, *o o'*, are partly covered with metal, and partly with ivory; the dark spaces on *o a'* represent the conducting parts of metal; the white are the ivory.

One end of the coil around magnet, M, is connected with Z, or pole of one battery, the other end of the wire, *a*, rests on *c*, the metal rim of one small cylinder. The wire, *b*, from the other pole, K, rests on the other metal part, *o*, and thus the electric circuit is formed. The arrows point out the direction of the current, which, when the circuit is formed, renders the magnet, M, powerfully attractive, but when the circuit is broken, it has no attractive power. On the opposite small cylinder, the wire, *e*, rests on a non-conductor (the ivory) therefore the electricity cannot pass from *d* to *e*, the circuit therefore is broken, and while M is a magnet M is non-magnetic, but as the cylinder revolves, it will be noticed the ivory and the metal pieces on the small cylinders, alternately break and close the circuits, and thus alternately attract the cylinder to give it a continuous rotary motion. Davidson used 78 pairs of 13 inch plates, the negative being iron, the positive ones amalgamated zinc. The result of power was very frail for such an amount of battery surface. We have heard no more about Davidson since.

Prof. Jacobi got out of 20 square feet of platina battery surface, one horse power.

(Continued on page 68.)