

Paragrams.

The newspaper *Frankfurter Zeitung* announces that all future warships for the German navy will be fitted with turbines.

Owing to faulty masonry, the entire tower of the new wing of the Canadian Dominion Parliament building collapsed. The workmen narrowly escaped.

Windmill electrical engineering is engaging much attention at the present time. The power of wind is used for developing electricity in many cases on a small scale, particularly in agricultural districts.

A novel fire escape is under test in a German theatre. It is so arranged that not only the pit but the boxes, balconies, and stage can be drawn bodily into the street on rails and by levers, emptying a building of 2000 people in the course of a minute or two.

In the *Annalen der Physik*, J. S. Sachs describes experiments which throw some light on the part which the earth itself plays in wireless telegraphy. He concludes that transmission is better the higher one is above the ground, and thence that the earth is detrimental to the propagation of electric waves.

There is some talk that Lake Titicaca, the largest lake in Peru and the highest navigable lake in the world, will shortly be utilised as a gigantic power generator to supply motive force for the southern railways of Peru, and probably also to provide electricity for lighting and other purposes in the Republic.

Messrs. Dwan Bros., of Wellington, are in communication with Mr. O. Harris, a former resident of that city who is now living in Brazil, regarding the supply of gold dredges for that country. Plans and specifications have been forwarded, and it is hoped that orders for several new as well as second-hand dredges will result.

The Scottish motor-car companies are so busy, it is reported, that they are compelled to refuse orders. One company, it is said, have made provision for three additional sections, which will employ 600 more hands. Another company has had to refuse a London order for 500 motor omnibuses, as its whole output is already secured.

Lord Avebury says "The properties of radium are no doubt marvellous; but I confess I should have expected that any life-originating process would have required a considerable amount of time as a necessary element. We must, it seems to me, suspend our judgment as to Mr. Burke's observations."

The boot and shoe operatives both in England and Scotland, are about to make a determined effort to secure an eight-hour working day. The long depression in this industry, and the large increase of output by improved machinery, are the grounds upon which they will appeal to the Board of Conciliation at its meeting during the current month.

The Berlin Corporation has decided upon the construction of an underground railway from the northern part of the city to its southern portion. The length of this new municipal line is about five miles, and it is proposed to cover this distance in 18 minutes. The construction of the new railway is to be completed within four years, and the cost is calculated at a trifle above 2,500,000*l*.

Mr. W. R. Cooper, of Bournemouth, England, has recently described experiments carried out on a flour-covered track with a tricycle hauled along at various speeds. A slack tyre is shown to raise more dust than one pumped tight. A square box carried at different heights above the ground raises less dust the higher it is above the ground; very little is raised when the box is inclined so as to throw the air down.

The Chinese Government, according to German papers, has granted its first patent. It is for an electric lamp, the inventor of which is an inhabitant of Nankin, the old capital of the Chinese Empire, who calls his lamp the "bright moon-light," and asserts that it is far superior to foreign

glow lights that hitherto have been sold at Shanghai and other Chinese cities. The fact that China has entered upon the granting of letters patent is undoubtedly of more importance than the invention.

French science is busying itself just now with perfecting the illumination of the working seams of mines. Incandescent electric lamps are not altogether safe, owing to their liability to break. Effort has been directed to producing a safety electric lamp, and one was last week submitted to the Academy of Sciences, for which M. Bertholte claimed that it has achieved this aim. Its inventor is M. Tommasi. His incandescent globe is enclosed in a glass cylinder, but the description printed by the daily papers is incomprehensible. We shall probably learn more presently, if there is anything in the idea.

The Corporation of Glasgow have decided to instal three further turbo-generators of 3000 kilowatts each, and the complete contract, including turbines, alternators (two of which are of Dick, Kerr and Co.'s make, whilst the third is to be of the Westinghouse Company's make), together with condensing plant, has been placed in the hands of Messrs. Willans and Robinson, Limited, of Rugby, who will manufacture the turbines and condensers themselves. Two of these turbine sets are intended for installing in the St. Andrew's Cross Station, whilst the third will be installed in the Port Dundas Station.

The largest masonry bridge in the world has recently been completed at Plauen, in Saxony. It has a span of 90 metres (295.4 ft.), the versed sine being 18 metres (59.04 ft.). It carries a roadway 11 metres (36.8 ft.) wide, and two pathways, each 3 metres (9.84 ft.) wide. The typical loads for which it was designed include a train of 15-ton wagons, or one of three steam rollers, weighing 23 tons each. The arch ring is built of a blue-grey-stone from the quarries of Theuma and Tippersdorf, laid in cement mortar. It is 4 metres (13.12 ft.) deep at the springings, and 1½ metres (4.92 ft.) deep at the key. The curve of the arch is of the three-centre type, the radius at the key being 105 metres (344.4 ft.). The work was started in August, 1903, and completed last summer, the total cost being about 29,500*l*, inclusive of about 1000*l* spent in land purchase.

An important addition is to be made to the Sacred Heart Basilica, Wellington, in the shape of two bell towers, which will be erected one at each side of the main entrance. The towers will rise 37 ft. above the present structure, and will be constructed of pressed brickwork and Oamaru stone. They will be surmounted by a dome covered with zinc fish-scale tiles with a finial carrying a cross. The window frames are to be cast iron, similar to those in the other part of the church. It is proposed to erect in one of the towers a bell weighing about 12 cwt., hung on a patent gallews of the latest design. The plans have been prepared by Mr. S. Cronin, architect, and a contract for the erection of the tower has been let to Messrs. McKennie & Co., the lowest tenderers. The contract price is £1045, and the work is to be completed in six months.

The Franklin Institute has awarded the Elliot Cresson Gold Medal for a new process by which iron can be made to grow. This consists in heating and cooling the bar of iron which it is intended to magnify to a "critical" temperature a number of times. The results are extraordinary. To the Mechanical Science Section of the American Association two bars of iron cast in one mould were presented for critical inspection. One bar remained exactly as cast. The companion bar had been caused to grow gradually in cubical dimensions till it is now 46 per cent. larger than the other, the weight remaining the same as before expansion. Both bars were machined on one side to show the texture and metallic appearance; and it was difficult to detect any change except the very apparent difference in size. It is said that important practical applications have already been found for this remarkable discovery.

Dr. Charles Davison keeps unceasing watch over the various earthquake shocks which are constantly visiting the British Isles more frequently perhaps than most people believe. In a recent paper he has described the Doncaster earthquake of April of last year. He tells us that it was a twin-earthquake with its principal epicentre half-a-mile north of Bawtry, and the other about four miles east of Crowle, close to the centre of the Hesse disturbance of April, 1902. Last April the earthquake-area included about 17,000 square miles. He says that a twin-earthquake is probably due to the differential growth of a crust-fold along

a fault which intersects it transversely, the first movement as a rule being one of rotation of the middle limb, accompanied by the almost simultaneous slip of the two arches, and followed soon afterwards by a shift of the middle limb.

In the course of the construction of the Simplon Tunnel numerous springs were encountered, and the water from one of these, about five miles from the Italian end of the tunnel, has been analysed by Mr. A. G. Levy. The water, which had a temperature of 113° F. at the point of collection, was clear, colourless, and without smell, but had a saline taste. It contained 106.5 grains of solid matter per gallon (about five times that of London drinking water), consisting principally of calcium sulphate, with a considerable proportion of magnesium sulphate, and small amounts of other salts. It was quite free from organic matter and also from chlorine, which latter fact was a remarkable characteristic of the water; since, considering the distance it must have travelled underground to attain its high temperature, one would have expected it to come in contact with soluble chlorides somewhere on its way.

A correspondent, who has probably read the article in our January number upon "The Business Man as viewed by an Engineer," writes as follows:—

"While we owe a great deal to engineers who adopt and fit together tried inventions and appliances, and who often gain a high reputation, it is to the daring inventive engineer who has the courage and grit to strike out beyond the beaten track, designing and experimenting on original lines, that the 'world of progress' owes so much; for while good managing engineers are essential to business, originality, and originality only, can advance the arts and sciences. While, therefore, we crown the manager with laurels, the successful inventor deserves a crown of gold and the highest place in the engineering profession; he is a leader, others follow. How often has the eminent manager-engineer derided the efforts of the inventor, but the pages of history say he only sees what is, all else is uncertain to him, and he timidly shrinks from anything new, lest it fail to realise all his expectations. But how are we to progress unless some have the daring to originate new ideas new processes, and new combinations."

The difference between the Massey-Harris Co., Ltd., and the Commonwealth Customs over the importation of stripper harvesters is to be fought out in the law courts. Sir William Lyne the Minister for Trade and Customs, is said to be determined to defend the case at every stage, and preparations to that end are being made by the Crown law authorities. According to cable advices from London, the Canadian company has supplied *The Times* with a statement of the dispute. It denies that the company is connected with the International Harvester Trust, or that there is any combination between the manufacturers and the railway companies.

INDIAN RAILWAY WORKING EXPENSES.—The average ratio of the working expenses to the traffic receipts upon the railways of British India only varies slightly from year to year; but it appears, upon the whole, to be rising. During the ten years ending with 1904 inclusive, the annual average came out as follows:—

Year.	Per Cent.	Year.	Per Cent.
1895	46.18	1900	47.85
1896	47.86	1901	46.79
1897	48.69	1902	49.24
1898	47.44	1903	47.52
1899	47.45	1904	47.35

The ratio varies very much upon particular lines. In 1904 it only stood at 33.89 per cent. upon the East Indian Railway, while upon the Jorkat Railway it was as high as 105.17 per cent.; that is, the working expenses were 5.17 per cent. in excess of the receipts. The ratio has always been low upon the East Indian Railway, having been 31.60 per cent. in 1895, and 33.89 per cent. in 1904. Upon the Bombay, Baroda, and Central India Railway, the ratio stood at 36.69 per cent. in 1895, and 47.20 per cent. in 1904; upon the Great Indian Peninsula Railway, at 55.48 per cent. in 1895, and 49.93 per cent. in 1904; upon the Eastern Bengal Railway, at 38.15 per cent. in 1895, and 54.48 per cent. in 1904; upon the Madras Railway, at 47.64 per cent. in 1895, and 58.41 per cent. in 1904; and upon the Southern Mahratta Railway, at 59.94 per cent. in 1895, and 63.46 per cent. in 1904. The gradual tendency of Indian railway working expenses to increase is probably explained by the fact that as way and works grow older the repairs which they require also grow heavier.

"Advertising is to Business what Steam is to Machinery — The Grand Propelling Power."—*Macaulay*.