THE City Engineer of Toronto has a scheme for improving the city water supply, which has, at least, the merit of being moderate in cost. He suggests the building of a tunnel from a point in the lake where the water is seventy feet deep, this tunnel to be run under the bay to the city. It will be about two and a-half miles long, and Mr. Jennings thinks it can be built for about $800,000.

NARROW plates of steel wrapped together form a much stronger bar than a piece of solid metal considerably thicker. Should the outside layer be broken there are the inside ones remaining still intact, while in the latter case, should the external skin be ruptured, the whole piece gives way. The seams in these wrapped bars are hardly visible, only appearing when, owing to use of great force, there is a twist in the metal.

THE experiments of Tesla, the Italian electrician, tend to throw an altogether new light upon many fields of electrical science. He proves that under certain conditions it is quite possible for a man to receive unharmed a current of hundreds of thousands of volts. He holds that the lighting of the ordinary 100-volt lamp depends but very slightly upon the high resistance of carbon, and proves it by lighting up tubes and lamps through his body.

THERE appears to be a good deal of misconception existing as to the real nature of an oil engine, many people imagining that it is a small steam engine taking its steam from a specially constructed oil-fueled boiler. As a matter of fact, however, steam plays no part in it at all as a working factor; but finely-divided oil combined with a supply of air is introduced and ignited in the working cylinder. One advantage possessed by an oil engine over the better known gas engine, which it somewhat resembles, is that it may be used anywhere, without regard to whether a gas or water supply is available.

THE value of the mineral production of Canada during the last few years has been steadily increasing. The Geological Survey Department, at Ottawa, have published a report which shows that while in 1886 the value was (metallic) $2,021,459, and (non-metallic) $9,096,719, it was in 1892 (metallic) $5,807,049, and (non-metallic) $13,234,267. The value of the Sudbury nickel output in 1890 was $933,232, while in 1892 it was $3,513,339. Copper shows a value of $354,000 in 1886, and of $1,160,760 in 1891; but this declined in 1892 to $821,589. Another metal which shows a decrease is gold. In 1886, it was $1,330,442, whereas in 1892 it was only $900,483.

IN parts of England there is a means employed for ventilating sewers and at the same time burning noxious gases, which is considered highly efficient. A Bunsen gas-burner heats to a high temperature a series of cast-iron cones over which the gases have to pass, and by contact with which they are destroyed. This plan having been objected to on account of the risk of gas explosions, another plan has been devised, which does away with the Bunsen burner. In this system, a safety furnace is placed in a ventilating shaft, surmounted by a lamp. The latter consists of a series of cylindrical rings; an intermediate ring divides the combustion chamber from the vertical air passages formed between the inner and outer rings of the furnace. To the outer ring the heat is conveyed by means of thick cast-iron webs, which form tiers of air channels through which the sewer gas passes.

THE reason why wetting coal should improve its combustion, is that it expands more, thus forming pores and cells which admit the air freely. The more uniform and porous the coal, the more accessible is it to oxygen. The combustion is thus more complete, and the quantity of smoke is lessened.

IT is a well known fact that the resistance of selenium is affected by light. Upon this is based the principle of an instrument for seeing over very great distances, called the klectroscope. By submitting a selenium cell successively to the various degrees of light reflected from the object under observation, a sort of pulsating current is produced, the pulsations of which correspond to the various waves of light reflected. These are transmitted over a line and reproduced at the receiving instrument, just as sounds are conveyed by the telephone.

IT was suggested by Faraday, that if we could discover the secret of the glow-worm and could concentrate rays of light, then we might have light in the middle of the night, without the waste caused by heating agents, such as gas, oil, or the electric carbons. Some experiments recently made by Tesla and by Papin seem to point to discoveries in the near future whereby it will be made possible to cause vibrations in the ether of the same nature as those produced by the sun. From this, it will be but a short step to the making of machinery for producing these vibrations by means of electricity,, and it will be possible to make a steady glow of light appear in a room diffused like the light of the sun.

THE electrical process for manufacturing diamonds is as follows: About 200 grammes of a mixture of cast iron and carbonized sugar is placed in a crucible of carbon, resting in a bed of magnesia, the whole being placed in a specially designed furnace, heated by an electric arc to about 3,000° C. After five or six minutes' subjection to this intense heat, the crucible and its contents are plunged very quickly into cold water. The interior is thus subjected to high pressure, which solidifies the carbon. On dissolving the metal with acid a number of very small diamonds are found.

THE name of asbestos porcelain is given to a newly invented French material, possessing, it is asserted, some special advantages over ordinary porcelain. The fibres of asbestos are exceedingly fine. French measurements show their diameter to vary between ·00016 and ·0002 millimetres, an exceedingly fine powder being consequently obtainable from them. If it were possible to amalgamate such small particles without the addition of any foreign substance, it is evident, says the *Electrical World*, that a material could be obtained, though porous in nature, the pores of which would be so fine as to be hardly visible under the microscope. The substance in question is formed by pulverizing the asbestos, from which powder a paste is made by mixture with water, and this paste is kneaded, diluted with water, dried and kneaded again, and then moulded into the desired form. By heating the latter in a crucible to a temperature of 1700° C., a porcelain is obtained with a translucency comparable to that of ordinary porcelain; or, if heated for eighteen hours, at a temperature of 1200°, porous asbestos porcelain results, of a light yellow or white color, if the asbestos powder be washed with sulphuric acid. Tests made with vessels produced from this kind of porcelain show a decided superiority of the article in certain chemical uses.