Electricity in Wellington.

The work of laying down the power mains through which is conveyed the electrical energy for the use of Wellington consumers, has been going on apace, and in about another month's time the present contract will be complete, when no less than 15 miles of cable will have been laid down. When this work has been finished, an extra length of 8 miles of cable will be installed, bringing the total up to 23 miles.

The business area of the city will then be reticulated with a network of power cables. This area includes all that portion of the city bounded by the harbour on one side, Sydney street on the north, and Lambton quay, Willis street (as far as Ingestre street corner), Ingestre street, and Kent terrace on the west and south.

The present power supply is quite up to requirements so far, but it is expected that there will be a big increase in the number of connections for supply up to 500 volts, and this will be amply provided for by the extensions which are now in progress.

Altogether there are 70 consumers of energy at present connected, and a further 20 have filed applications for supply when the necessary preparations for the application of the same to plant and running gear have been completed.

The supply of energy for the month ending 30th November, 1907, reached a total of 15,926 units.

Anglo-French Exhibition.

THE LIGHTING.

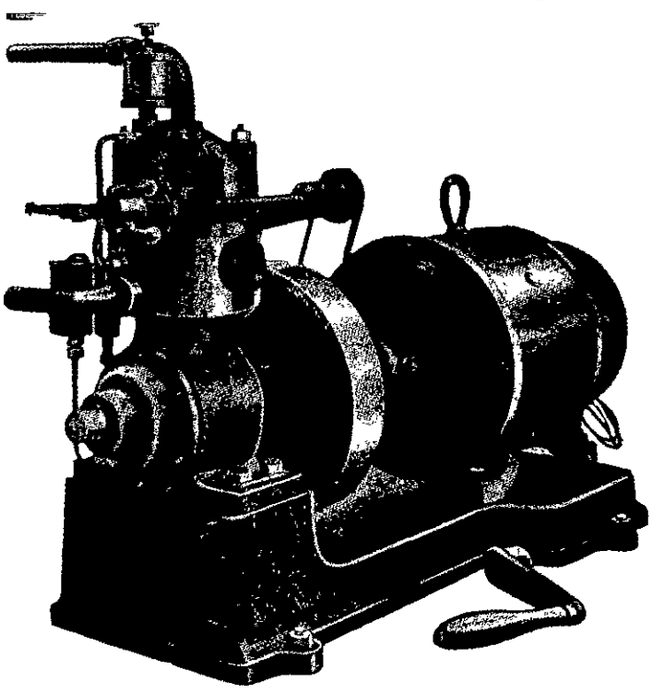
The organisers of the Anglo-French Exhibition at Shepherd's Bush have conceded the electric lighting of the exhibition to French houses. Now, the Exhibition covers 140 acres; the buildings comprise the Royal Pavilion, the Garden Club, the Palace Restaurant, and the huge machinery court; while in addition there are the main British and French sections. There are extensive gardens, and the colonial section adjoins the stadium in which quadrennial Olympic games are to be held. This vast area will be capable of seating 68,000 persons, every one of whom will have a good view of the games. There is a running track, three laps to the mile, already laid down, and a cycling track, two-and-three-quarter lap to the mile, in course of construction, and when a football match is being played, the visitors were informed that as many as 150,000 persons will be able to witness the play. A bath 1000 metres in length has been contructed in which swimming competitions will take place. Altogether there will be twenty palaces, 400 ft. long by 70 ft. wide; and it may be added that the great machinery hall will contain over 250,000 ft. of space. To have secured the contract for the electric lighting of such a vast exhibition is very suggestive of the up-to-date superiority of the method of the French electricians.

For the past two and a half years two 500 k.w. vertical turbines have been in operation at Christchurch power house, and the total consumption of oil for that period was 100 gallons, the oil being returned to the supply tanks from time to time. This 100 gallons has now been drawn off and used for lubricating tramway axles, and the total loss of oil for the above-mentioned period has worked out at only 20 per cent. Repairs on these machines have also proved remarkably small, amounting to the mere replacement of three white metal bearings having an average life of twelve months, and which were re-metalled at a cost of £5.

Light in the Country.

The facility with which electric light may be applied to a hundred-and-one purposes in and around a country house appeals most strongly to those who are accustomed to the conveniences of urban life. There is no doubt, however, that a large number of those whose homes are in the country have been deterred by the cost of installation from adopting electricity, either for lighting or for supplementary purposes. Recognising the fact that a widespread demand exists for an electrical plant so designed as to fill all domestic requirements, and yet not unduly encroach upon the pocket of the average householder, the manufacturers of the "Ideal" electrical outfit have made an exhaustive study of the special conditions attaching to the electrical equipment of country houses, and the following particulars reach us from Messrs. George and Stokes, Auckland.

The "Ideal" electrical outfit is distinctive in point of—(*a*) reliability, (*b*) simplicity, (*c*) compactness, (*d*) low cost. It consists of a dynamo to generate the current, an engine to drive the dynamo, a battery to store the current, and a switchboard to control it. The engine is petrol-driven, vertical, two-cycle in action, giving an impulse every revolution. The design of the engine eliminates all moving valves, the passage of the piston opening and closing the parts admitting and discharging the gases. This design may be said to entirely overcome the vibration nuisance. In almost every other make of direct-coupled plant the engine only receives an impulse one stroke out of four, and the connecting rod is alternately in tension and compression. With



THE "IDEAL" LIGHTING SET.

the "Ideal" engine, however, every second stroke is a useful or working stroke, and the connecting rod is always in compression. Efforts have frequently been made to secure vibrationless effect of two-stroke engines by multiplying the number of cylinders. This, though possibly modifying one evil, merely aggravates another, in that it entails the multiplication of complicated valve gear. There can, therefore, be no doubt as to the superiority of an engine which not only has no valves, but which will also work steadily and quietly on one cylinder alone.

Most engine troubles are located somewhere in the valve gear. Running at high speeds of necessity develops considerable wear in the relatively delicate mechanism of a valve. A little grit may lodge and hold it open or keep it shut. Periodical grinding is necessary, or the valve will not bed properly. Springs lose their elasticity, and the "timing" is thrown out. The "Ideal" engines have no valves, only ports, and as long as the piston moves up and down these ports must be opened and closed. The timing is positive, because the relative position of the ports, once determined, can never be changed. The cylinders are water-cooled by thermo-syphonic circulation. Lubrication is semi-automatic. The governing is close and efficient. As the engine and dynamo are direct-coupled on the same bed plate, all belting is dispensed with, and the utmost possible compactness is thus secured, the "Ideal" sets occupying, power for power, less space than any other on the market. In addition to this, the absence of belting not only removes a danger to those working about the engine room, but also eliminates the loss in power due to belt-slip and friction—a by no means negligable quantity.

The dynamo is specially built for the work. It is so wound as to afford close regularity of voltage, the bearings are long and are fitted with continuous, or "ring" lubricators, while, in accordance with modern practice, the brushes are carbon, of ample sectional area to carry the maximum current. The "Ideal" storage batteries are, as to design and manufacture, both mechanically and chemically correct. Careful consideration has been given to the conditions under which the country house battery usually works, the plates being made of the best lead and of a section that will insure rigidity and absence of buckling. The sets are made up in the smaller outfits of 27, and in the larger sizes of 54 cells, each set consisting of glass boxes with trays, oil insulators, spray plates, non-corrosive connecting lugs, dilute acid and stands.

The switchboard is handsome and symmetrical in design, and consists of a base of polished enamelled slate framed in oak or other suitable wood. The addition to the switchboard of charge and discharge meters is strongly to be recommended, by means of which the amount of current taken out of and put into the storage battery may be determined. By making use of these meters the common fault of overdischarging the battery is obviated.

Taking the "Ideal" outfit as a whole, we must conclude that it is an immensely successful one as regards the saving in capital, outlay, and running expenses. Thus, the manufacturers are enabled to place a complete electric lighting plant within the reach of the man of moderate means. We understand that Messrs. George and Stokes, Limited, are prepared to submit full particulars, etc., of the "Ideal" outfit.

The Edison Battery.

The daily press has again been concerned as to the latest magical discovery of Mr. Edison. The long-promised battery — which is to revolutionise the motor-car industry, consign all petrol vehicles to the scrap heap, create a boom in aeroplanes and flying machines, and relegate the horse to the limited sphere of a zoological exhibit or domestic ornament, and so on—is about to be presented to the world at large. To the general public these announcements, exaggerated though they may be, are good reading, and as such sufficient; but the engineer requires facts and details.

A recent issue of the *Electrical World* contained some extracts from the many patents recently taken out by Mr. Edison in connection with his development of the new storage battery. The series of patents reveals a remarkable perfection of detail in experimental work, and affords testimony as to the sustained ingenuity of the inventor. One of the patents covers a method of making seamless steel battery boxes or cans. The manufacture of these seamless steel vessels is effected by means of electrolytic deposition in a number of steps, each of which is important and essential to the success of the process. Hollow brass or copper moulds of the proper form are first coated with an exceedingly thin layer of paraffin wax, over which a coating of graphite is applied. The layer of wax is so thin that the graphite apparently makes contact through the wax with the mould. A coating of copper of about 0.004 in. in thickness is then applied electrolytically. The mould is then removed, washed, and introduced into a second tank, where it receives an electrolytic coating of nickel about 0.001 in. thick. Then it passes into a third tank containing a neutral ferrous ammonium sulphate solution with iron anodes. Here it receives an iron coating of about 0.02 in. thickness. In order to prevent the formation of pits or holes in the deposited iron coating, which would be likely to form by the accumulation of gas bubbles thereon, and in order to secure a very smooth surface, a quantity of crushed charcoal is introduced into the solution, whereby the added material will rub over and scour the surface of the deposited metal, polish the same and wipe off any gas bubbles which may tend to accumulate. During the ironplating the mould is rapidly revolved at a speed of about 1½ r.p.s. The mould is then removed from the tank and washed in water of a temperature of about 75 deg. C., thereby melting the wax originally deposited on the mould. The deposited can is then removed