

indicated—work which can be obtained from an ordinary engine of 12 or 14 nominal horse-power. At present, as a matter of fact, the machine is worked by the large Galloway engine which is employed to run the machines supplying the lights at Charing Cross (South-Eastern), and Waterloo Stations. A Brotherhood engine is at hand with which to provide against the contingency of an accident to the ordinary driving engine, and there other dynamo machines in the works which could be instantly substituted, if necessary, for those in nightly use. One point which should be noticed in the arrangements in this district is that use has been made of gas lamp-posts with a view to show at how small a cost a change might be made from gas to electricity. A pipe 2½ ft. in length has been fastened to the top of each lamp-post used, and above this the electric lamp is fixed. The alabastrine globes used are of almost porcelain-like whiteness, and denser than those in the Siemens' district, absorbing, it is computed, from 40 to 50 per cent. of the light, but yielding a pleasantly soft and diffused colourless light which, although estimated as of 1,000 candle power, can be looked at without pain to the eyes. The light within is considered equal to the light of 2,000 candles. The carbons, of which there are two pairs in each lamp, are made to burn for about 16 hours without attention, the change from the burnt-out pair to the second pair taking place by the intervention of self-acting apparatus. There is no clock-work used for the adjustment of the carbons, the movement of these necessary to keep the points at a proper distance being effected by automatic electro-magnetic apparatus of a simple kind. The extinguishing of a light in the circuit is provided for by an automatic "cut-off," and the light of the other lamps is not thereby appreciably increased. The carbons, which are coated with copper, are 12 in. long, and a little over three-eighths of an inch (11 millimetres) in diameter. Above the lamps is a little shelter-roof of metal, not unlike the covering of a lych-gate, which acts to some extent as a reflector.

So far as it has gone the experiment appears perfectly satisfactory, except to some who object to the display of this magnificent light to the "few old housekeepers and numberless cats" which they say constitute the night population of the city. It is of course too early to say anything definite about it, but there seems little doubt that the action of the civic authorities has given an impetus to the progress of electric lighting, which, if not leading to its speedy adoption will certainly tend to a final decision on its merits. For ourselves we do not despair of seeing the day when an electric lamp will be as necessary to the plant of a builder or contractor as a steam engine or a ladder.—*Building and Engineering Times.*

### THE FORTHCOMING INTERNATIONAL EXHIBITION OF ELECTRICITY AT PARIS.

FROM THE "ENGLISH MECHANIC."

The exhibition to be held in Paris, in the Palais des Champs-Élysées, formerly called the Palais de l'Industrie, which is to be opened to the public on the 1st August next, promises already to be one of very great importance, and will doubtless make an era in the history of electricity and its application to the useful arts. The formation of the proposed Exhibition has been intrusted to the Minister of Posts and Telegraphs, who occupies the corresponding position to that of Postmaster-General in this country, and it was authorised by a decree of the President of the French Republic, dated October 23rd, 1880. A very influential and representative commission, which includes the names of all the most eminent scientific men in France, has been nominated, and a technical committee has been appointed to concert measures for a comprehensive and complete series of trials of the apparatus and inventions forwarded for exhibition. The different European nations, with the marked exception of England, have nearly all of them already expressed their willingness to take part in the exhibition, and the commissioners nominated by Belgium, Austria, and several other countries are making preparations for bringing the objects of the French Government before their countrymen. It will be fresh in the memories of our readers that, in reply to a question put by Sir Henry Tyler in the House of Commons a few days back, Lord F. Cavendish declared that it will be impossible to appoint a commissioner for England, nor can our Government take part officially in the forthcoming exhibition. The determination arrived at by our Government has caused much surprise and vexation in Paris, where our cordial co-operation and prompt and willing assistance in 1878 produced so much satisfaction and friendly feeling. The French themselves look forward to the exhibition for the settlement of many doubtful points and disputed claims in the appli-

cation of electricity, and, failing all other participation, we may hope at least to have some independent and authoritative reports from experts in this country on the results of the various trials and competitions.

With respect to dates for sending in applications for space, and the nature of the objects to be exhibited, the following particulars may be of service to English exhibitors, who, in the absence of any official representative, may make their applications direct to M. Georges Berger, at the Palais des Champs-Élysées, Porte No. 4. Such applications, on forms which must be obtained from the Commissioner, must be forwarded not later than the 31st instant. The exhibitors will, on or before the 15th May, receive notice of their admission or otherwise, and of the space which has been allotted to them. All objects intended for exhibition may be sent in on and after July 1st. The packing-cases must bear special distinctive labels, and the Railway Companies have agreed to reduce to a very considerable extent their through rates to the Exhibition. There will be no charge for space, and the general decoration of the building will be undertaken by the French Commissioners, who reserve a right of supervision over the special decorations of individual exhibitors. Motive power will be provided at a reduced rate to all exhibitors, and for the trials and competitions the necessary power will be furnished free of cost. There will be a congress of electricians during the Exhibition. The usual regulations concerning the labelling of objects, right of free admission to exhibitors and their attendants, police arrangements, maintenance, etc., are included in the programme.

Empty cases will be warehoused by the French authorities at the rate of 6 francs per cubic meter. Special protection will be afforded to new inventions during the period of the Exhibition, until three months after its close, in accordance with the law of May 23, 1868. A catalogue will be published by the French authorities, and diplomas and medals, to be adjudged by a jury of experts, will be awarded to successful exhibitors. The exhibition will be divided into six groups, comprising in all sixteen classes.

Group I. Production of electricity:—Class 1. Static electricity; class 2, batteries and other accessories; class 3, magneto and dynamo-electric machines.

Group II. Transmission of electricity:—Class 4. Cables, wires, and accessories; lightning conductors.

Group III. Electrometry:—Class 5. Apparatus for the measurement of electricity.

Group IV. Application of electricity:—Class 6. Telegraphy, signalling; class 7, telephones, microphones, photophones; class 8, electric lighting; class 9, electro-motors, transmitters of electric force; class 10, medical electricity; class 11, electro-chemistry; class 12, instruments of precision, electro-magnets, magnets, compasses, electro-horology; class 13, miscellaneous apparatus.

Group V. General machinery:—Class 14. Generators, steam motors, gas motors, hydraulic motors, shafting suitable for trades employing electric force.

Group VI. Bibliography. History of electricity:—Class 15. Bibliographical collections of works concerning the science and the industrial employment of electricity, plans, diagrams, etc.; class 16, retrospective collections of apparatus connected with the first study of electricity and its early application.

This classification is simple and good, and if the various groups are well represented, the display can scarcely fail to be one of great interest; but the commissioners look forward to the trials which are to take place during the meeting of the Congress as the most important feature of the exhibition. The display will remain open to the public until the 15th of November.

The funds for the exhibition will be obtained partly from a State subsidy and partly by public guarantee. The guarantors can in no case, however, receive more than four per cent. interest on their investment. It is intended to light up the building by night by means of the various electric lamps, which may be exhibited, and the Palace will be opened each evening from 8 till 11 p.m. All the details appear to us to have been most carefully considered by M. Georges Berger, who has had great experience in such matters.

THE TIDES OF ELECTRICITY.—Mr. Alex. Adams, one of the officers of the British Post-office Telegraph Department, has discovered the existence of electric tides in telegraph circuits. By long continued and careful observations he has determined distinct variations of strength in those earth currents, which are invariably present on all telegraphic wires, following the different diurnal positions of the moon with respect to the earth.