

# NEW LIGHTS IN BROADWAY.

## BRUSH'S SYSTEM AGAIN TESTED LAST EVENING.

THE STREET FLOODED WITH DAYLIGHT FOR A MOMENT—EXPERIMENTS THAT WILL BE MADE TO-NIGHT AND THE ARRANGEMENTS FOR THEM.

From time to time yesterday afternoon, and during the earlier hours of the evening, people on Broadway were startled by the blazing forth of the electric lamps, now singly, now in groups of half a dozen, until at last a whole circuit was in operation. Then, as suddenly as they had blazed forth, the lights went out, and the thoroughfare, which an instant before had seemed flooded with daylight, was left to the glimmer of gas-jets, that only served by comparison, to render the darkness more visible. These were only the preliminary tests of an electric lighting system invented for street purposes by Mr. C. E. Brush, of Cleveland, and which has been in operation in Western cities for the last year or two, and is regarded by its projector and by the best critics as a practical success. It has been an open secret in scientific circles for the last few months that the Brush Electric Light Company had obtained permission to erect lamps upon a limited section of Broadway, and had occupied the large building at No. 133 West Twenty-fifth-street for the purposes of a central electrical station, at which to generate the supply of energy required for out-door circuits of lamps. The progress of the project has, however, been kept very quiet, as there are many rivals in the field, and Mr. Brush did not wish to be either hastened or anticipated in his first Metropolitan experiment. The result of this reticence has been that at 6 o'clock this evening a trial which is alike of popular and economical importance, as well as of interest to electrical engineers, will, if no untoward accident occurs to prevent, be formally made by the Brush Electric Light Company. The preparations which have been silently in progress for some weeks were only completed on Saturday evening, when, with a sufficient force of workmen, Engineer McGrath connected the conductors from lamp to lamp, extending over a section of Broadway embracing 20 squares.

The system is thus distributed over an area of about 6,000 square yards, from Fourteenth street to Thirty-fourth, which gives, considering the altitude at which the lamps are placed, an atmospheric space to be illuminated of about 48,000 cubic yards. Along this area, at intervals of a block, iron columns, whose summits are surmounted by carbon lamps of the Brush pattern, have been erected. The standards are not far from twice the height of an ordinary lamp-post, placing the arc and globe at an actual elevation above the surface of from 20 to 25 feet. They are constructed in two sections, the lower section being fluted, and the upper furnished with iron projections, serving as foot-rests, to enable the attendant to climb readily to the top and adjust the carbons when necessary. The globes are of larger diameter than those ordinarily employed with the electric lamp, and perfectly plain, with the exception of a section at the base, where the glass is ground to improve the refrangibility of the light, and soften its vertical effect. There are 22 lamps distributed over this space, but it is not proposed to put them all in operation this evening. On the other hand, the circuit extending from Fourteenth to Twenty-sixth streets will be employed for the crucial test, and the second circuit will be comparatively disregarded. The area in front of the Fifth-Avenue Hotel is supplied with two lamps, placed a few feet above the central axis of the large eight-burner gas fixtures, with which the section of Broadway bounded on the west by Madison-square is usually lighted. Including these two, the number of arcs put in operation this evening will be 17 in all, and with these it is expected to produce an illumination far superior to that of the many gas-jets ordinarily required to light this space of 3,000 square yards. There are already several electric lights belonging to private persons distributed at different points between Fourteenth and Twenty-sixth streets, and general observers have, in advance, formed some idea as to the availability of the electric lamp for thoroughfare purposes. The general verdict has been that, while for the illumination of large but distinctly bounded spaces, such as the floors of warehouses, factories, and stores, the electric light is superior to any other, its effect in the open air of a street or park is less agreeable than that of gas. Sir William Armstrong, in a recent address on the progress of the electric light in Europe, has given voice to this opinion very explicitly, but his views were based upon the observation of systems confessedly inferior to those in operation here. The Brush experiment will be regarded with interest both by economists and electricians, because, comparatively speaking, it will settle the issue by practical tests either for or against the pretensions of electrical engineers.

The first preliminary experiments, or rather tests, were made by Engineer McGrath on Saturday evening after the work was completed, but they were only intended to verify the electrical connections and insure the successful working of the circuit to-night. The power to operate the system is supplied by a Corliss engine, located at the central station, No. 133 West Twenty-fifth-street, and propelling the armatures of the three large generators by which the electricity is furnished at the rate of 800 revolutions per minute. The Corliss engine is one of 100-horse power, considered more than sufficient to operate the lamps, and the generators are of the largest pattern, capable of supplying a steady current to 16 lamps of 50 gas-burners each. No attempts were made by the electrician on Saturday evening to measure the actual candle-power of the arcs in different azimuth; but such will be made if the experiment proves as successful as its projectors anticipate. It is a familiar fact that the electric lamp gives its maximum light in direction downward at an angle of about 45°, while in the horizontal plane and in the upward direction the illumination is comparatively very inferior. To compensate for this defect the lamps, as arranged for the experiment, have been placed at a considerable elevation, so that the areas of maximum light furnished by the system may be available at the street level over the largest attainable space. It was noticed by the few who witnessed the test on Saturday evening (at about 11:30) that some of the lamps were extremely irregular and flickering, the light now blazing out brilliantly for a moment, and now dying until the glowing carbons were visible as lurid embers to the eye of the observer. This defect was confined to those furthest from the central station, from Fourteenth to Twenty-third-street, but whether from any inadequacy in the conductors is uncertain, while the two in front of the Fifth-Avenue Hotel, and the three above that point, burned very steadily and regularly, with a slightly bluish tinge that, notwithstanding the brilliancy of the illumination, was a little dismal and depressing in comparison with the deep and agreeable yellow of the surrounding gas-jets. The lamps in front of the hotel will present this evening a particularly good opportunity to compare the light of the voltaic arc with that of ignited gas, the former being placed vertically above the centre of a circle of eight gas-jets, at a distance of less than three feet, so that both can be viewed at the same glance, and their impressions compared with each other. The tests yesterday were more satisfactory both as to steadiness and as to quality of light.

The automatic regulation of the distance between the carbon electrodes in these large lamps for street use is compassed by the same means as are employed in the smaller Brush lights manufactured for factories and warehouses. It has, it is said, proved fully equal to its out-door purposes in the large open spaces of streets and parks in Western cities, particularly in Cleveland, Ohio, where experiments similar to that which will be initiated this evening have been tried. The source

of the automatism is a special magnetic arrangement, which, by means of a lever and collar, connects with the upper carbon-carrier, and elevates or depresses it according to the requirements of the arc, thus maintaining the same average of resistance at this point in the circuit. This device is claimed by electrical engineers to be vastly superior to the old method of feeding the electrodes toward each other by clock-work, in the operation of which no allowance could be made for lack of uniformity in the composition of the carbon pencils. The lamps that will be used this evening are all arranged upon one circuit, and may be operated by one large generator, located at No. 133 West Twenty-fifth-street, and connected with the system of lighting by conductors about five times the diameter of ordinary telegraph wires.

The experiment will be witnessed by experts, and if successful enough to warrant continuance, photometric measurements will soon be made, and data to demonstrate the economy of electricity for street illumination will be collected and collated by competent men. It is calculated that it will cost 40 cents to run one of these lamps 16 hours, or 2½ cents per hour, including renewal of carbons, expense of operating the engine and generator, &c. This would be equivalent to 2½ cents per square per hour for the whole area of New-York City, but practical results are worth reams of calculation based upon imperfect data. The lamps, it should be said, are less powerful than those used in Cleveland, being reckoned at only from 750 to 1,000 candle power, while the average of a gas-jet is from 9 to 15. The trial will be continued under the same conditions as gas-light, and repeated night by night until the public is convinced of the practicability of the project.