SCIENCE

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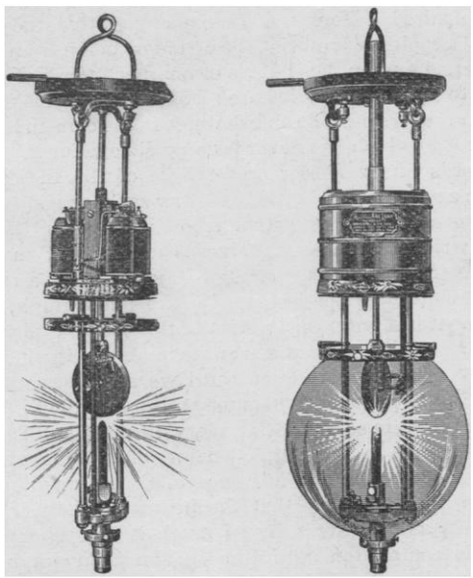
A SUPERIOR ARC-LAMP.

MANY efforts have been made by trained electricians and other experimenters, both in the United States and in Europe, to apply the disk carbon to the electric arc-lamp, every one appreciating how much more brilliant and lasting a light would be where the disk carbon was used rather than the ordinary pencil carbon, provided that it could be controlled. Until the present, all efforts in this direction, so far as made public, have ended in complicated and clumsy contrivances altogether unsatisfactory, and too expensive for general purposes in lighting.

The invention, of which we present illustrations, has for its object to provide an arc-lamp that will burn about twice as long without re-trimming as the arc-lamp now in general use, at a cost of constructing and operating not greater than that of the ordinary arc-lamp. It consists in the combination of a vertically moving and intermittently rotating carbon electrode in disk form, with a pencil-shaped carbon electrode, fixed and immovable, standing vertically in the bottom of the lamp-frame. Arc-lamps as heretofore made burn about eight hours, when the carbons will be consumed; and if longer service is required, they must be renewed.



THE RUSSELL DISK-CARBON ARC-LAMP.

This lamp will burn and give a full light for about eighteen hours, and it may be so constructed as to burn twenty four hours before renewing the carbons. The cost of the carbons is less than the cost of those ordinarily in use in proportion to the amount of carbon in them. The electric current is less than that required by other arc lamps, as the length of carbon resistance is two inches less. The pencil being stationary, the disk is made to revolve slowly by the vibrations of the armature and the ratchet arrangement shown in the sectional view, and thus made to burn evenly around the centre. The disk descends a little lower after each rotation than it was during the previous rotation, and so on until the disk is as nearly consumed as it may be. As the disk presents a greater surface of contact, a stronger and more steady light is secured; and over seventy per cent of the light is reflected below the disk, and not thrown above.

The lamp is provided with a device for arresting sparks, so that none can get outside the globe. It is known as the Russell electric lamp, and is attracting attention in Boston, where it is being introduced by the company controlling its manufacture.

ON THE USE OF THE PHONOGRAPH IN THE STUDY OF THE LANGUAGES OF AMERICAN INDIANS.

THE invention by Edison of the phonograph, and the improvements in its effectiveness which rapidly followed, naturally turned attention to the possibilities which it presents in the preservation of the languages of the aborigines of the United States. It was recognized independently by several persons, that, if the instrument could be brought to a certain stage of perfection, it would serve as a valuable means for this purpose; but no one, as far as the author knows, has published an account of experiments made to test its capabilities in this direction.

In order to determine its present value for this purpose, the author undertook a series of experiments,[1] taking for that purpose the language of the Passamaquoddy Indians, who are the purest blooded Indians now living in the confines of New England. The result of these experiments has fully justified his expectations, and convinced him that the instrument has now reached such a degree of perfection that it can be adopted by scientific students for that purpose. He believes that it is a most valuable auxiliary in linguistic researches, and that it should be used in the study of the fast disappearing languages of races, and in making record of those which are rapidly becoming extinct.

It is thought that phonetic methods of recording Indian languages are not all that might be desired for this purpose. Even with the assistance of the admirable system of letters and conventional signs which have been proposed for that purpose, there are many difficulties besetting the path of one who would accurately record the aboriginal languages, which are but imperfectly met by this method. There are inflections, gutturals, accents, and sounds in aboriginal dialects which elude the possibilities of phonetic methods of expression. It is desirable, also, to preserve songs, sacred and secular, which are rapidly becoming extinct. Their counting-out rhymes often have inflections which are imperfectly expressed by letters. The use of the phonograph among the Passamaquoddies has convinced me that the main characteristics of their language can be recorded and permanently preserved, either for study or demonstration, with this instrument.

On a visit to Calais, Me., undertaken in March, to make experiments on the value of the instrument in recording Indian languages, many cylinders full of records were taken. These embrace a large variety of subjects, such as it was thought would represent, in a general way, the main peculiarities of this branch of the Algonquin languages. The records taken may be roughly classed as follows: 1. Songs; 2. Folk-tales; 3. Pronunciation of

[1] The author read a paper on this subject before the American Folk-Lore Society at its last meeting in Boston on April 19. This paper will be published later. These experiments were carried on preparatory to taking the instrument for the same purpose among the Pueblo Indians of New Mexico. The work was done under the auspices of the Hemenway expedition.