lying on the same plane and is perpendicular to the axis of oscillation of mirror 2. By these means, the elements of the image formed by the lens 1 are in succession following a continuous zig-zag line transferred to the focus of a lens 4 placed in the opening of the reflection tube 5, said lens parallelizing the rays which meet the image point. At the receiver two similar mirrors 6 and 7 oscillating synchronously with the mirrors 2 and 3 respectively, throw the train of rays emerging from the reflection tube to the eye of an observer as indicated. The synchronous vibration of the respective pairs of mirrors is accomplished by ingenious means outside the scope of this article. It becomes apparent from this invention that by substituting for the lens 4 some electrical means such as a combination of selenium cell with a revolving shutter, pictures may thus be transmitted electrically without using reflection tubes such as are shown in 5.

In fact, a system of this sort was tried some years ago by the Russian inventor Szcepanich.

Any reader interested in the aforegoing patents, by sending a self-addrest envelop to the author can ascertain the numbers of the patents which have been discust in this article. Most of these patents are very ingenious, and contain a good deal of information on television which has not so far appeared in print outside of the patent office records.

RESEARCH AND ITS IMPORTANCE TO HUMAN PROGRESS.

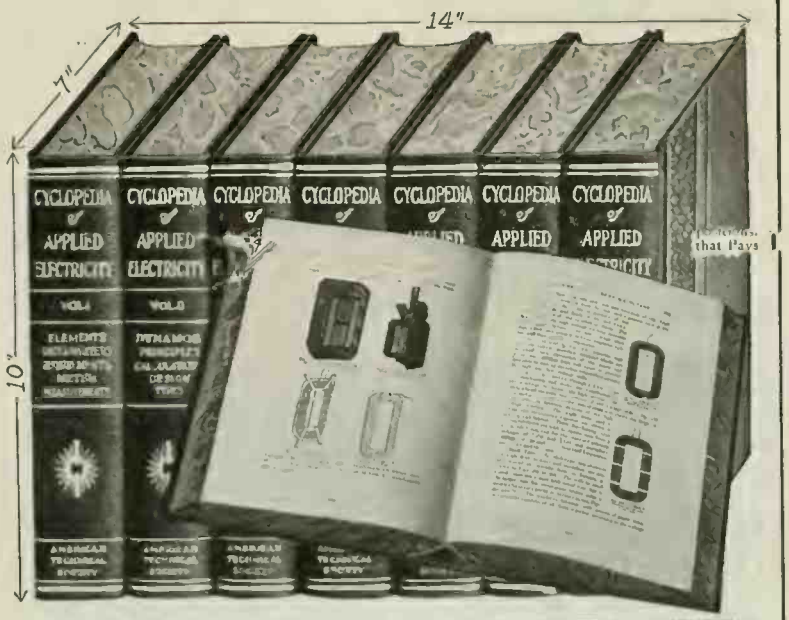
By Dr. W. R. Whitney

(Concluded from May Issue)

make a practical success.

A SMALL electric furnace was then devised for baking the rods and this was so arranged that the rate of rise of temperature, the maximum temperature reached and the duration of heat at any temperature, was under control and was also recorded. The desired result was obtained and this work was thus finished. It gave us a certain stock of knowledge and assurance.

At that time a very similar problem was bothering one of the engineering departments. Lightning arrester rods, part of the apparatus for protecting power lines from lightning, were needed. Their dimensions were ¾x6 inches and they needed to have a definite, but, in this case, *low* resistance, and could apparently not be baked in a porcelain kiln. The necessary variations in such a kiln are so great that, in practise, many thousand rods were repeatedly fired and afterward tested to yield a few hundred of satisfactory product. It was evident that regulation and control of temperature was necessary. This was found to be impracticable in case any considerable number were to be fired at one time, as the heated mass was so great that the rods near the walls of the retort received a very different heat treatment from those near the middle and were consequently electrically different. This difficulty led to experiments along the line of a heated pipe, thru which the rods could be automatically past. Some time was spent trying to make a practical furnace out of a length of ordinary iron pipe, which was so arranged as to carry enough electric current to be heated to the proper baking temperature. Troubles here with oxidation of the iron finally led to substitution of carbon pipes. This resulted in a carbon tube furnace, which is merely a collection of six-foot carbon pipes, embedded in coke powder to prevent combustion, and held at the ends in water-cooled copper clamps, which introduce the electric current. By control of this cur-



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