ENGINEERING

New Transmission System May Bring Power Greater Distances

Invention of Pittsburgh Engineer Expected to Make Possible Development of Far Distant Super-Power Projects

A NEW SYSTEM of electrical transmission that will carry many times more power than is now sent over the greatest transmission lines and will take it twice as far as is now possible, is the invention of Clarence A. Boddie, an engineer of Pittsburgh.

The invention is expected to make possible the construction of super-power projects which have heretofore been impossible because the power plants would have to be located too far from industrial centers where the electrical energy would be used.

Two such projects that have become sound economic possibilities as a result of the invention, according to Mr. Boddie, are the development of the St. Lawrence River and the building of a huge steam plant in the heart of the Pennsylvania coal fields to supply New York and Philadelphia with electricity.

Already the world's largest hydro-electric power plant at Conowingo, Md., is becoming inadequate to supply the increasing eastern power demands, Mr. Boddie explained. To meet these additional power needs, engineers are already planning a huge coal-burning steam plant to be located at Sunbury, Pa. They prefer to put this plant farther west in the heart of the cheap soft coal region, but because of the limitations of present transmission lines they are designing it for the anthracite region at Sunbury, which is much nearer New York and Philadelphia, Mr. Boddie said. He hopes that his new transmission system will make possible the more favorable location of this plant.

With the new system, engineers would also be able to send power 500 miles from the St. Lawrence River to industrial centers of the East, whereas with present lines it is possible to send electricity only about 250 miles in useful large blocks without too great loss.

Mr. Boddie's transmission line is exactly like those now in use, except for one simple change: Instead of using only one wire at a high voltage he uses two, or three, or four, or five, all at the same voltage—the more, the better, within practical limits of construction. Present transmission lines are usually made of three wires, each insulated from the others and at a different voltage.

If Mr. Boddie rebuilt this line he would substitute a number of wires for each single one. Instead of one old cable, let us say that he uses four, as the drawing shows. These four cables are separate wires yet they are one conductor; that is, they are not insulated from each other and if the wind blows them together no harm is done, there is not even a spark. The old three-wire, three-conductor transmission line has become a twelve-wire line, each conductor being made of four wires.

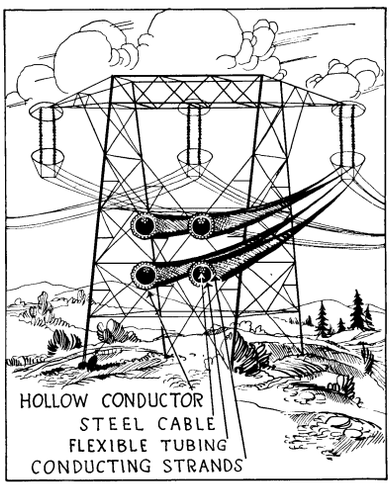
Easier to Operate

A simple change! Let us see what good it does.

Suppose our first three-wire, three-conductor line operated at 220,000 volts, the highest potential of the greatest transmission lines in America today. After we make it a twelve-wire line it can be operated at 575,000 volts. And it can be made to carry eight times as much power as the old 220,000-volt line. It is also found to be easier to operate than the lower voltage line.

An application of a simple principle of physics, is the way Mr. Boddie explains this discovery that may bring cheaper power and consequently more leisure to everybody in America. And there is one apparently little thing, he is careful to add, on which the whole new system depends. Each of the four wires must be just as large as the single wire of the old system.

Transmission lines today cannot operate at higher voltages because the electricity will leak off into the air. Engineers have found that electricity will leak away from a small wire more readily than from a large one, even though this large wire is hollow. The engineers might easily solve the problem by making transmission lines out of copper stovepipes, if ice and wind would not tear them down. They would be large enough to have a low "breaking-down point," and hence would carry a great amount of power without losing it to the air.



EIGHT TIMES AS MUCH

Power can be sent over Mr. Boddie's four-wire conductor transmission line as over the present greatest lines, engineering calculcation shows. More than twice the voltage is expected to be used without exceeding the corona limit.

Instead of using impractical stovepipes, Mr. Boddie has simply increased the number of wires per conductor. In this way he gets a surface area as great as that of a stovepipe.

Mr. Boddie has written a book that explains the new system, not in terms of stovepipes, but with the exactness of engineering mathematics. He has sent the book to prominent engineers throughout the country asking them to criticize and to pick flaws with his system, and many have already replied, giving their professional approval to the plan.

Science News Letter, July 11, 1931

PALEONTOLOGY

Mastodon Remains Found in Turkey

TEETH, tusks and parts of the skeletons of mastodons have been found along the coast near Istanbul, where two cavern regions open on the sea. The finds were made by a Turkish physician, Dr. Fikri Servet, and have been reported to *Science* by Prof. George D. Hubbard of Oberlin College, who is resident in Istanbul during the present year. There are also indications of human occupation in one of the caves. The exploration of the region has only been begun; and Prof. Hubbard promises a fuller report after his return to the United States.

Science News Letter, July 11, 1931