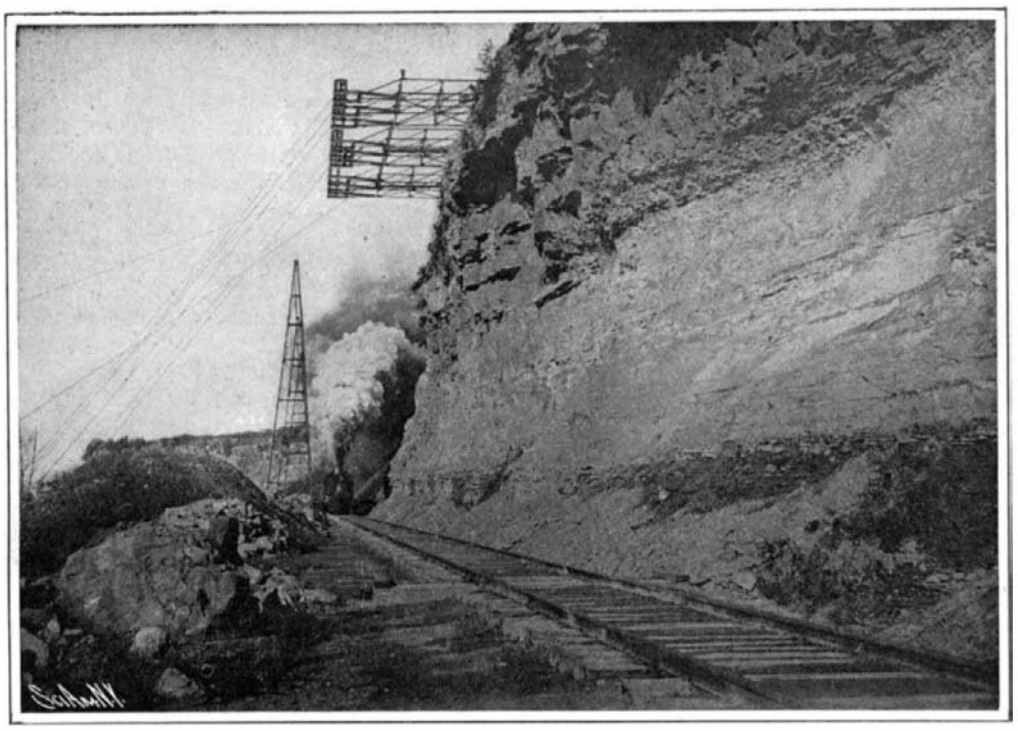
ALUMINIUM TRANSMISSION LINE ACROSS NIAGARA GORGE.

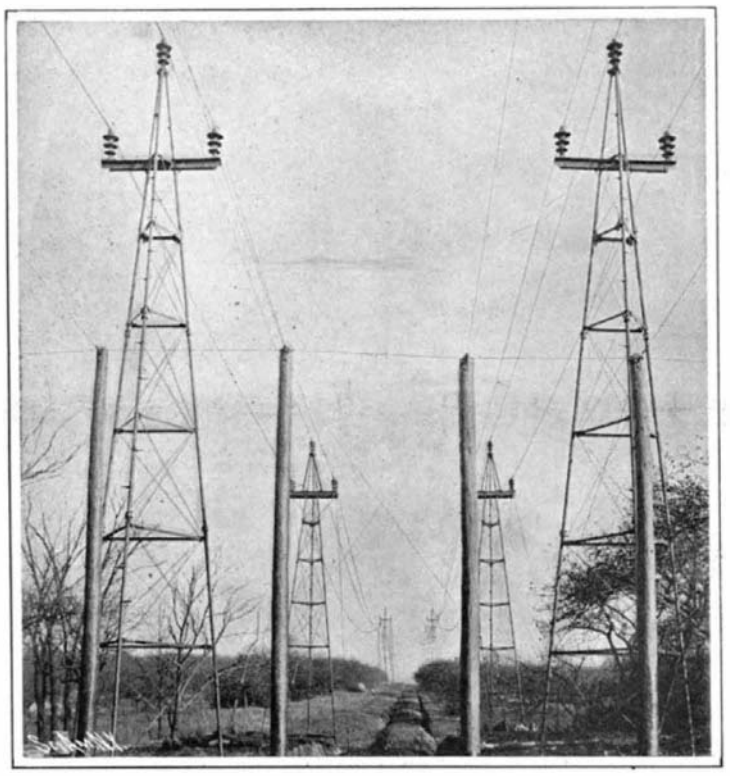
BY ORRIN E. DUNLAP.

Niagara Falls is the center of the aluminium industry in America. Two large plants manufacture aluminium there, one being located on the lands of the Niagara Falls Power Company, and the other on the lands of the Niagara Falls Hydraulic Power and Manufacturing Company at the edge of the high bank. The first-mentioned plant receives its electric power from the power houses that have the big tunnel as their tail-race, while the last-mentioned works receives current from a power house located at the water's edge in the gorge. It was in connection with the power service of this plant that one of the most remarkable fires ever witnessed at Niagara Falls occurred on the night of September 9, 1905. A short circuit occurred on the cables extending up the cliff from the power house. The insulation burned fiercely, and the fire swept up the bank to the gatehouse of the power company in the rear of the aluminium works. Some of the cables were aluminium, and others were copper. Since then a new wire tower has been built over one of the big penstocks that stand out from the cliff in column form, and new aluminium cables strung. Each of the two legs of this new aluminium cable service has eighty-four cables in it, each cable having eighteen wires. Leaving the wire tower at the top of the bank the cables pass through a tile and cement conduit to the pot room of the aluminium works. From this same power house aluminium bars erected on another penstock carry current to the plant of the National Electrolytic Company.

The new power transmission line between Niagara Falls, Canada side, and Lockport, Rochester, and Syracuse, in the interior of New York State, is being erected with aluminium cables, which are erected on steel towers that have three or four legs. It is on this power line that the first cables for the transmission of power across the Niagara gorge that are not carried on a bridge have been erected. The crossing point is well down the river from the Falls, possibly four miles. Cantilever arms project from the cliff top to carry the cables, which drop down to towers that stand close to the water's edge on either side of the river. From tower top in Canada to tower top in New York State the aluminium cables swing over the rough waters, provision being made for nine cables, or three three-phase transmission systems. On the New York side the cables rest on the towers at the water's edge, passing up to towers on the line of the New York Central road, and then up to the cantilever arms at the top of the bank and to a transformer station there located. Between Niagara Falls and Buffalo thousands of electrical horse-power are transmitted over aluminium cables, so that the new work in the electrical field about Niagara bears testimony to the wonderful popularity of aluminium for power transmission lines. The new Niagara transmission line seems destined to be one of the most notable power transmission lines in the country. At the point of crossing the Niagara River there are nine cables, each composed of nineteen No. 5 wires, and the span across the river is in the neighborhood of 600 feet. Eastward from the New York end six cables of aluminium have been strung on the towers, and the work of carrying the line into the interior of the State is progressing rapidly.



CANTILEVER ARMS THAT HOLD THE ALUMINIUM CABLES OF THE NEW NIAGARA TRANSMISSION LINE.



ALUMINIUM CABLES OF THE NEW NIAGARA POWER TRANSMISSION LINE STRUNG ON STEEL TOWERS.

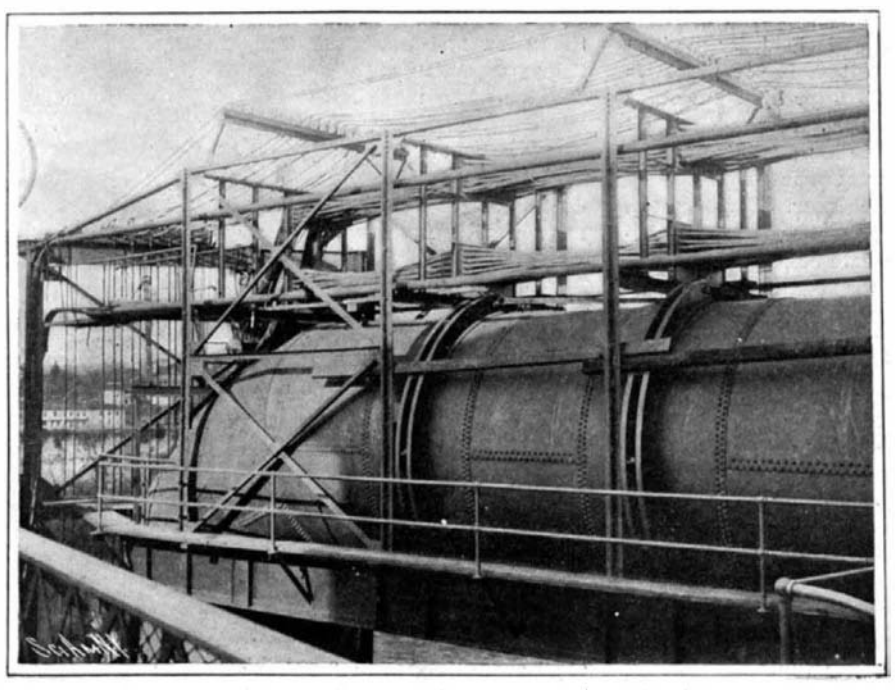
Some Novel Developments in Wireless Telegraphy

Count Georg von Arco, the well-known experimenter in wave telegraphy, recently lectured on the above subject in the great hall of the Berlin Military Academy. After discussing the electrical apparatus used in the generation, transmission, and detection of electrical vibrations, Count Arco emphasized the possibility of measuring the electrical phenomena that attend wireless telegraphy with the same accuracy as those controlling other branches of electricity, the safety in the operation of wireless stations having recently been considerably increased. He next demonstrated, by means of convenient models, the mechanism of wireless transmission from one end of the hall to the other, succeeding for the first time in calling up independently six stations located close to one another without interfering with the operation of any one. The responses of the stations were given by means of signal bells tuned to various sounds. The experience recently made in practical operation agrees with this experiment, the numerous stations so far installed working with perfect regularity and without mutual disturbance.

As to the military uses of wireless telegraphy, these have been put to practical tests, both in the Russo-Japanese war and in connection with the Herero uprising in southwest Africa. As regards, on the other hand, the commercial uses of this modern means of communication, the lecturer mentioned some interesting recent applications, e. g., to supplement cables in the case of defects in the latter, or else to constitute a permanent connection between such points as do not lend themselves to a connection by either cables or overhead wires. Several such plants are at present in course of construction; for instance, a connection between Rhodos Island and the Dernah coast station on the north African shore (750 kilometers) as well as another between two localities in the interior of Peru, where the dense vegetation of the forests absolutely precludes the possibility of installing a connection by wire

The great importance of provisional wireless connections in the case of uprisings, strikes, etc., as for instance those at present occurring in Russia, was next pointed out, such provisional connections by means of transportable stations being now effected in a few hours' time even over great distances.

In riveting with pneumatic hammers, two men and one heater average 500 rivets in 10 hours, whereas by hand 250 rivets is a good day's work for three men and one heater. The cost per rivet, according to the Engineering and Mining Journal, was 1.62 cents by pneumatic hammer, and 3.68 cents by hand. On 93,480 rivets in a shipyard at Chicago the machine cost was 1 cent to 2.5 cents; the hand cost 2.5 cents to 4.5 cents.



ALUMINIUM CABLES IN THE NEW WIRE TOWER.

NEW ALUMINIUM TRANSMISSION LINE ACROSS THE NIAGARA RIVER.