SCIENCE

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SOME NEW ELECTRIC RAILWAYS.

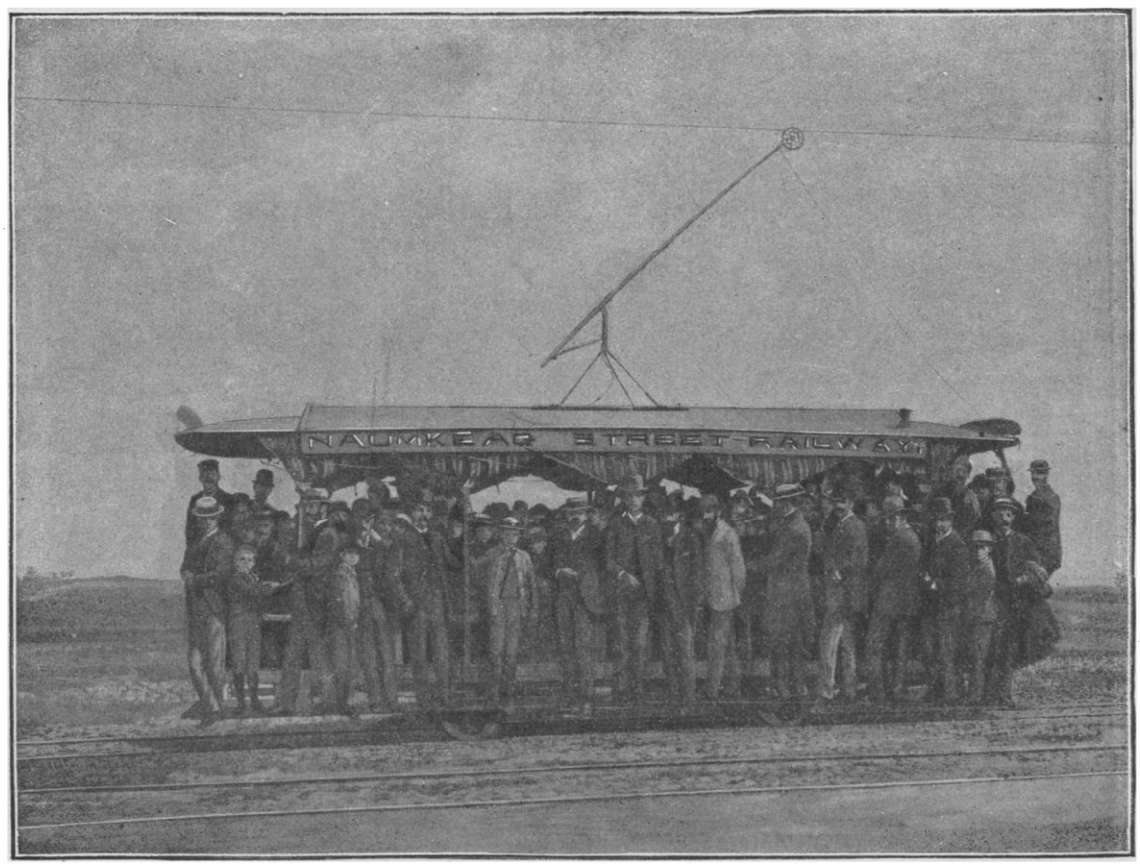
WE present in this issue a view taken from a photograph, last summer, of one of the electric cars on the Naumkeag Street Railway of Salem, Mass., of which Mr. Charles F. Odell is president. This electric road was equipped during the past year by the Sprague Electric Railway and Motor Company of New York, for the summer traffic between the city of Salem and a watering-place about a mile or two away, known as the Willows.

The cars ran very successfully all last summer while in use, carrying large numbers of passengers, and giving perfect satisfaction to the president and directors of the road, who, it is said, intend adding more electric cars in the spring, and extending the line as far as Beverly.

The illustration which we give presents a good idea of the large number of passengers which these cars often carry on pleasant days during the summer. In spite of the heavy load, these cars move with quickness and despatch, and mount the steep grades on the line at the rate of eight or ten miles an hour. These grades, before the introduction of electric power on the road, have often compelled horses to succumb in drawing the heavily loaded cars.

The regular Sprague overhead system in use upon the road here includes the small No. 6 wire as a working conductor, which is the only wire suspended over the centre of the track; the main current being carried at the side upon a heavy copper conductor, which is connected at intervals of every one or two hundred feet to the working conductor.

One of the most important electric railways in the country is that in operation at Cleveland, O., also on the Sprague system. We present a view on the road, showing one of the Sprague cars drawing another on Euclid Avenue. The road has been in operation now for about a month, and has carried a large number of passengers, who are delighted with the new motive power, and the quickness with which the cars can be started and stopped, their speed, and the ease with which they mount the grades and round the curves. The lighting of the cars by electricity is another great advantage.



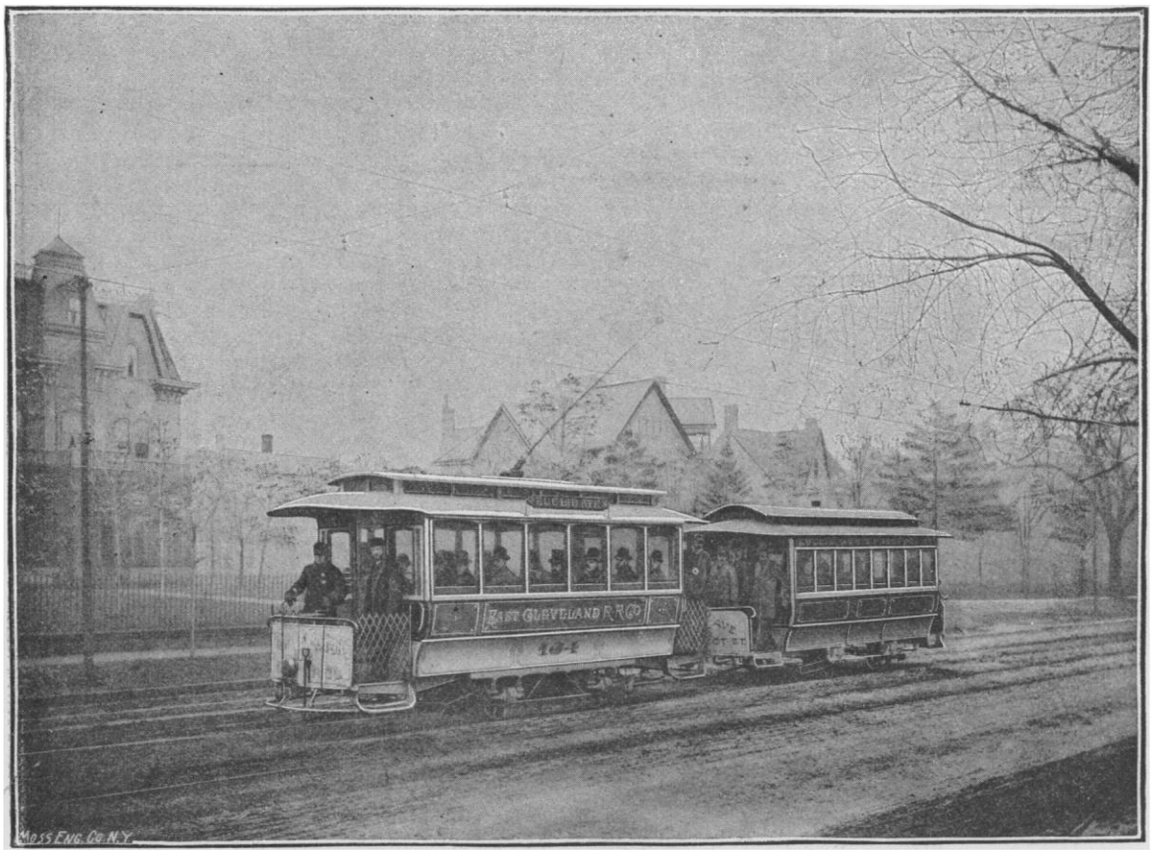
SPRAGUE ELECTRIC RAILWAY AT SALEM, MASS.

The equipment of this road is similar to that of the Sprague Electric Road in Boston, Mass. The poles used are of iron throughout the entire length of the line, and the overhead work is unobtrusive, making the whole line-work unobjectionable. The power-station for generating the current is one of the most complete of its kind in the country. It is fitted with Edison dynamos, Armington & Sims engines, and every thing is so arranged that its

capacity can be easily quadrupled without changing the line of machinery.

Since the road has been in operation, it has been visited by delegations from all sections of the country, of railroad men, who have inspected the operation of the road with the view of introducing the Sprague system upon their own lines. The East Cleveland Railway Company have afforded them every opportunity for inspection, and the result has been that a large number of contracts since the opening of the road have been awarded to the Sprague Company.

In a recent snow-storm which occurred in the city of Cleveland, the tracks were all covered to a depth of from six to eight inches; and the horse-railways in that city were delayed in their trips, and only ran intermittently. The electric road, on the other hand, made regular trips, ploughing its own way through the drifts, and successfully demonstrating the advantages of electrical



SPRAGUE ELECTRIC RAILWAY AT CLEVELAND, O.

over animal power. The Sprague Company are now equipping snow-ploughs, to be operated by powerful electric motors, for this road; so that no snow, however deep, will be able to stop the running of the cars. It is estimated that these electric ploughs will clear the tracks quicker than an ordinary plough drawn by a dozen horses.

Among the cities which are coming into prominence in the Southern States, there is none probably in which the application of electricity for industrial purposes has received greater attention, and been more extensively applied, than in Asheville, N.C. We gave a description, in a recent issue, of the successful opening of the electric railway which connects the city of Asheville with the railroad-depot, distant about a couple of miles, which has been running successfully.

Although possessing a successful railway, the attention of the Asheville citizens in regard to electric power has not been devoted exclusively to railway-work; but there are a number of stationary motors in the city which are giving satisfaction. Both the Asheville *Citizen* and *Country Homes* are printed by electric power. On account of the perfect regularity of speed which is the characteristic of these motors, on account of their differential winding, they are peculiarly adapted to the operation of printing-presses. There are also several machine-shops, carpenter-shops, and elevators which are using the Sprague motors.

HEALTH MATTERS.

Climate of Colorado.

DR. WALTER A. JAYNE presented an exceedingly interesting paper, on "The Climate of Colorado and its Effects," to the American Climatological Association at its recent meeting. In his paper he discusses the air of Colorado both as to atmospheric pressure and dryness. The annual rainfall is between fifteen and sixteen inches, — a small amount as compared with the United States in general. The winds are at times disagreeable and annoying by reason of the dust, but no injurious effects result from them except physical discomfort. In concluding his paper, he says that there are one or two very simple rules which all consumptives coming to high altitudes should understand and observe, since, because of the unusual characteristics of the climate, they are so important that neglect of them will retard recovery, and in advanced cases may destroy the slight chance still remaining to the invalid of receiving benefit from the change, and lead to a fatal result.

1. The approach to elevated regions should be gradual and by easy stages, not, in these days of Pullman coaches, to spare fatigue, but in advanced cases with limited lung space, and in those with fever and considerable activity of the disease, to avoid over-taxing the capacity of the lung to adapt itself to the rarefied atmosphere. For the same reason the invalid should, for a time after arrival, either take very moderate exercise or none at all.

2. The residence should be continuous and prolonged.

He is confident, that, were the first of these rules more generally followed, we should hear far less of the ill effects of high altitudes,