

A TROLLEY WAGON FOR COUNTRY ROADS.

The subject of traction on common roads early received the attention of engineers, and many experiments have been tried to solve this interesting and important problem. The steam traction engine has been used to a limited degree, but it does not appear to have been so successful as it might be. Light automobile carriages have been used to some extent, and it is probable that in the future they will attain a considerable usefulness. The electric carriage offers advantages for use on common roads, but it is doubtful if they will prove very successful, owing to the great weight of the storage batteries, except on the most perfect roads that have small grades. The subject of the transportation of farm produce has engaged the attention of economists and even of the government. It is easy to cite statistics which show that the farmers in country districts lose vast sums annually owing to the difficulty of transporting their produce to the railroad by which it can be shipped to the consumer or exported. In England the light railway has been tried with some success, but the expense is against its more general use.

We illustrate a system which is certainly remarkable for its novelty and which in districts where water power is available should be very successful. The trolley electrical road wagon shown in our engravings is the invention of Mr. W. G. Caffrey, of Reno, Nevada, who has associated with him Col. H. B. Maxson. The cost of installing the overhead trolley system is not prohibitive, and where a cheap source of power is obtainable the expense of working and maintenance would not be great. Mr. Caffrey has been at work upon this system for three years, and the wagon which we illustrate has been tested successfully. A line of ordinary poles was set up near the Reno foundry and the dynamo placed therein. The two wires were secured to the poles about eighteen inches apart and seventeen feet from the ground and a trolley with a lazy tongs arrangement allowed the current to be furnished to the wagon. The problem which the inventor had to solve was a difficult one, as a perfect circuit must be maintained at all times and the contact must be flexible enough to allow a wide divergence from the regular road if necessary.

The improved form of trolley works admirably. It consists of a metallic frame having two over-running wheels, and underneath these are the two locking wheels, which effectually prevent the top wheels from leaving the wire and still allow the frame to pass the support, holding the wire on the pole. On the lower wire a similar device is used. The two trolleys are connected by an insulated pantograph or lazy tongs equipped with suitable guides, thus providing for unequal tension on the trolley wires. The poles are 24 feet long and 6 inches in diameter at the small end. They are placed at intervals of 125 feet. On the inner or road side of these poles are two supports or "pass-bys" of malleable iron. No. 0 bimetallic wires are used. The current is supplied to the wagons by cable which

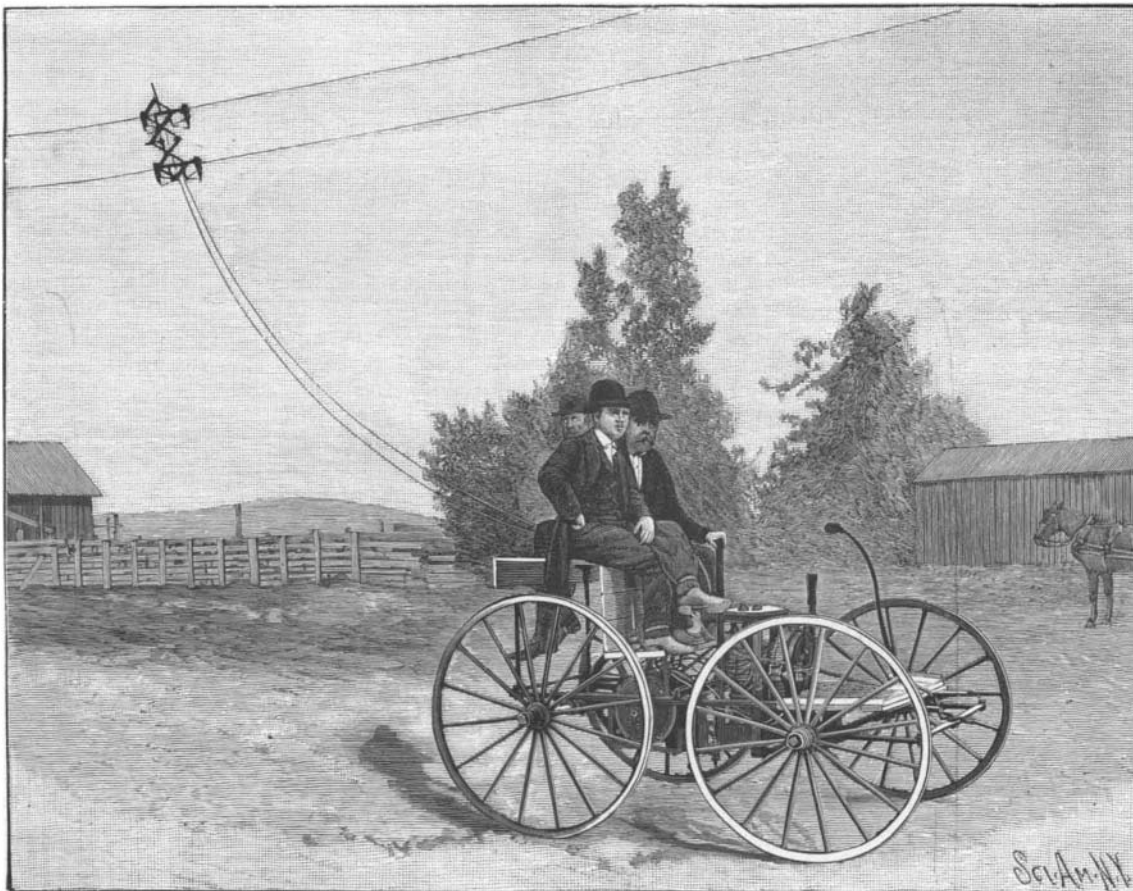
runs on an automatic reel on the wagon, permitting the cable to run out 200 feet if necessary, or wind up to a short length, thus allowing the wagon to follow the ordinary road and permitting it to turn or do anything required of it. The ordinary trolley pole may also be

two arms are connected, and the connecting bar again connected to the steering bar. This gives quick turning qualities with easy manipulation. The generator used was a five horse power compound wound Westinghouse 500 volt dynamo. It is said that on the trial trip a speed of fifteen miles an hour was reached with a load of 2,500 pounds on the wheels. The control of both the motor and the steering apparatus was all that was desired. The trolley moved easily over the wires and there was no difficulty with the "pass bys."

The development of the long distance power transmission and the utilization of this or some similar system will prove of great value to the farmer and those who have occasion to transport goods along country roads.

The Salt Habit.

The use of salt as a condiment is so general and so universally believed in as necessary that we rarely hear a word against its excessive use, but there are a multitude of persons who eat far too much salt; eat it on everything—on meat, fish, potatoes, melons, in butter, on tomatoes, turnips and squashes, in bread and on a host of foods too numerous to mention. To so great an extent is it used that no food is relished

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used, but the cable permits of running the wagon on either side of the ordinary road, allowing it to meet or pass vehicles without difficulty.

The four-wheeled wagon shown in our engraving has wheels 48 inches in diameter. The rear wheels are fastened to a shaft geared to a spring-suspended motor. The motor is a two horse power one of the Westinghouse crane type. In front of the motor a commutator controller is suspended, the handle of which is within easy reach of the person steering the wagon. The front axle is trussed and the spindles are pivoted to the wheel hub, with an arm extending forward about 18 inches, fastened rigidly to the spindle. These

which has not a salty taste, and this hides more or less the real taste, which is often very delicate. Now, the amount of salt required in the system is comparatively small, and if the diet has been rightly compounded, very little is necessary. Some go so far as to discard its use altogether, but whether this is wise or not we will not here consider. What are some of the evils of the excessive use of salt? They are to paralyze the nerves of taste, or to pervert them so that they cannot enjoy anything which has not a salty flavor, and in addition there is a direct tax on both the skin and the kidneys in removing it from the blood. Whether the skin is harmed by this tax we do not know. Possibly it is not greatly injured,

yet we know that few people possess a healthy skin; but it is now pretty well settled that an excessive use of salt does overtax the kidneys in its removal and that the great number of cases of derangement and disease of these organs is due to this use. It takes only a little time to learn to enjoy many kinds of food without salt, and we advise our readers and others to look into this matter and to try and diminish the use of this condiment as far as possible. We believe they will be better for it.—Journal of Hygiene.

**FRONT VIEW OF TROLLEY WAGON.**

At Crevalcore, a small town situated on the outskirts of Bologna, there was unveiled on September 8 a bronze monument erected in honor of Marcello Malpighi, the celebrated Italian anatomist, botanist and microscopist, the contemporary, among others, of Hooke, Grew and Oldenburg, names famous in the early annals of the Royal Society. Malpighi's relations, indeed, with that society were close and cordial throughout. His interesting correspondence with Henry Oldenburg, its first secretary, and with men equally concerned in the "Improvement of Natural Knowledge," is carefully preserved in the society's archives.