

IN THE FIELD OF ELECTRICITY

SOME interesting facts concerning the economy of operating motor-propelled trains upon the subsidiary and feeding sections of a trunk railroad, in comparison with the expense of maintaining and working similar lines by steam locomotives and short trains, have been furnished by the Taff Vale railroad in Great Britain.

The running cost per train mile by motor car equals 4.18 cents, as compared with 10.62 cents by steam locomotive and four carriages of the ordinary type. The cost of repair and renewals of the motor car is much less than that of the other system, being only 2.92 cents per train mile, as against 12.44 cents for the steam-propelled train. The wages represent 3.86 cents in the former case, and 6.94 cents in the latter instance.

Taken on the whole, therefore, it will be observed that the total cost per train mile of the motor car works out at only 10.96 cents, while the cost for the locomotive and carriages is 30 cents per train mile, representing a saving in the case of the former of 19.04 cents, or some 60 per cent cheaper. The economy thereby effected is very appreciable, and represents quite a considerable sum in the course of a year's operation. This result is highly encouraging and will lead to a more extensive development of the motor-car system of handling short-distance traffic.

Already several of the other trunk railroads of the country, impressed with the figures obtained by the Taff Vale railroad, are completing arrangements for the introduction of motor-propelled coaches upon their systems in those sections where the capacity of the traffic does not sufficiently warrant the employment of a locomotive and train, and wherein the working of the latter at present represents a heavy loss.

Telephones for Farmers.

Progressive farmers in different parts of the country are availing themselves of the opportunities that make life worth living in the country in these days. The agriculturists of Genesee county, New York, are thoroughly up-to-date. Not content with the benefits of the free rural delivery system, they are enjoying the luxury of a telephone system. It is of incalculable benefit to many an isolated farmer.

One man connected with the family of a neighbor by telephone. From this it grew until fifteen farmers connected their homes. Finally they formed a stock company and spread the 'phone system throughout the county, making also long-distant connections. No one who has once had the telephone will do without it willingly.

Now 200 farmers of the county enjoy the service. It enables them to keep constantly in touch with the markets and to gather news of all kinds, to talk with the grocer, the preacher and in fact to be in instant communication with the outer world. The original fifteen farmers still control the stock company, and now furnish telephones to their fellows at as low a rate as is possible. For convenience, and to insure perfect working of the line, the farmers are divided into sections and the number of telephones in a district is limited. The telephone and mail service and the great improvements being made along good roads augur well for the future social and business outlook of those who dwell so near to nature.

Electric Fan Novelties.

The newest thing in electric fans is a little one that can be attached to any electric light fixture in place of a lamp. You simply unscrew a lamp bulb and screw into its place the little fan and turn the key and the fan starts buzzing.

Another new small fan is an electric vaporizer, used for spraying perfume, or a disinfectant.

Still another little electric fan may now

be found installed in telephone booths, to make those often confined and close little compartments more comfortable to the person using the telephone.

Many improvements have been made in electric fans since their first introduction, and they are now made in very great variety. Now there are fans attached to their support by a swivel, on which the fan can be turned sideways, while the fan motor is supported on trunnions, on which it can be inclined to any angle, upward or downward, from the vertical; so that the fan can be made to deliver its breezes in any desired direction without moving its support.

And there are now fans which as they run revolve continuously on their support, throwing off the air currents in all directions.

There are also oscillating fans, that swing constantly back and forth within any arc of a circle.

There are fans with the fan set in a horizontal plane to deliver the air vertically where the direct currents would be disturbing, as in dining rooms.

New Wireless Telegraph Receiver.

According to L'Eclairage Electrique of Paris, a new receiver for wireless telegraphy has been invented by a French electrician, which is described as follows: "As is well known, the surface tension at the surface of contact between mercury and acidulated water is affected by the passage of an electric current from the one to the other. This action may be made to cause the mercury to shift its position in the tube, and in this way close a local circuit. The apparatus consists simply of a capillary tube partially filled with mercury, having the part above the mercury filled with acidulated water, and having its lower end dipping into a similar solution. The antenna is connected to a wire leading into the upper part of this tube, and connection is made to the ground from the vessel by means of a wire, good conductivity being secured by a layer of mercury on the bottom of this vessel. Two wires from a local signalling circuit are led into the capillary tube, one being below and the other just above the normal position of the upper surface of the mercury. When electric waves encounter the antenna, the changes in potential set up at the surface of the mercury cause the latter to rise and close the local circuit, thus giving the signal. A variation of this device consists of two capillary tubes, both sealed into a glass vessel, which is partially filled with acidulated water, and covered with a flexible diaphragm. The diaphragm is then covered by a second vessel from which two rubber tubes are led off. The oscillations of the mercury, due to electric waves, are thus communicated to the diaphragm, and the latter converts them into audible signals which can be heard by applying the tubes to the ear."

Electric Wiring Regulations.

After a long delay the commissioners have at last adopted a code of regulations governing the practice in electric wiring in the District of Columbia based upon an act of congress, the securing of which was marked by much difficulty. The growth of the electrical installations outstripped the legal safeguards until it is known there were some very bad examples of wiring, perhaps highly dangerous. Under the new regulations it will be possible for the commissioners to overhaul all such bad work and to set up new standards to be reached by all equipments, whether old or new. The electrical science has now progressed to the point at which it is possible to reduce the danger from this source to an almost negligible minimum. Enough is known of the character and the tendencies of the electrical current and of the methods to be adopted for its safe confinement to enable skilled workmen, using proper materials, to wire a residence, store, theater or other large establishment so that no danger need

ever be apprehended. It is, however, a suggestive fact that whenever a fire of mysterious origin occurs the first assumption of the authorities is that it was caused by electric wires, if such are on the premises. For it is well known that in the early days of the use of electricity for lighting and power purposes, and even during the late days of insufficient regulation, such bad work was done and such poor materials were used that the chances of fire being caused in this way are high. Of course much depends upon the thoroughness with which the regulations are enforced and upon the spirit in which the property owners meet them.

A Telephone Paradox Explained.

An engineer explaining the apparent paradox that the more business a telephone company does the less profit it makes per subscriber, says that the switchboard in the exchange is built in sections, each of which contains on an average the terminals of the lines of 200 incoming subscribers. These terminals are called "jacks," and the panel containing them is called the answering panel. In addition to these 200 incoming jacks, each section must contain the outgoing jacks of each subscriber in the exchange. This is necessary in order that the operator in each section may be able to connect any of the incoming subscribers in a section with any other subscriber in the exchange. The panel containing these outgoing jacks is called the multiple panel. On the above basis the switchboard in an exchange of 2,000 subscribers would contain ten sections, that of a 5,000 exchange twenty-five sections, and that of a 10,000 exchange fifty sections; consequently each section in exchanges of these capacities would contain respectively 2,000 jacks, 5,200 jacks and 10,200 jacks. The total number of jacks in a 2,000 exchange is therefore 22,000. The average mind would at once arrive at the conclusion that the total number of jacks in a 5,000 switchboard would be two and one-half times that of a 2,000 (or 55,000), and that the total number in a 10,000 switchboard five times that of the 2,000. A 5,000 capacity switchboard, however, would contain twenty-five sections of 5,200 jacks each, or a total of 130,000, while a 10,000 capacity switchboard with its fifty sections of 10,200 jacks each would contain 510,000 jacks. For sake of argument we will say that each jack with its connection and labor represents a cost of \$1. Each new subscriber added to a 2,000 exchange has to be "multiplied" into ten sections, necessitating ten jacks; but each new subscriber added to a 5,000 exchange has to be "multiplied" into twenty-five sections, requiring twenty-five jacks; while each new subscriber added to a 10,000 exchange has to be multiplied into fifty sections, requiring fifty jacks. Now, as to the number of "hello girls" necessary to operate exchanges of the size mentioned: While one operator can take care of each section of a 2,000 capacity switchboard, the larger exchanges require three or more operators per section, besides assistants, relief operators and monitors. It is, therefore, evident that a company starting out with 2,000 subscribers, on a basis of say \$50 per year for service, makes less profit on each 300 subscribers added; and such is the decrease in the profit as the exchange mounts up to 5,000 or 10,000 that the company must either increase its rates or quit. One of the most interesting exhibits in the St. Louis exposition is that of the invention of a German named Faller, who has succeeded in eliminating the multiple feature, not only from automatic practice, but also from present manual practice.

Electric Heating and Cooking.

As to the cost of electric domestic heating and cooking, an authority makes the point that while low rates for current will be necessary to popularize the electric method generally, it has a wide field at higher cost than its competitor, gas, and

for the same reasons that gas has had such general recognition, although it costs more than coal. Electric lighting, too, it may be called to mind, costs more than gas directly, but its many advantages, such as cleanliness, convenience and safety, are gains that are now appreciated to have a cash value. In houses where the work is in the hands of the ignorant "help," there is not a good field today for electric cooking, but in the home where the mistress is the cook, entirely, or in part, and in small houses in suburban towns and the smaller cities, the field is wider. The freedom from heat, offensive products of combustion and leaky valves; the inevitable soot, dirt and chance explosions incident to gas and the absence of all cooking devices between periods of use, owing to the portability of electric heaters, are tangible advantages in addition to the more perfect results obtained. In thousands of homes gas is used as an auxiliary to the coal range for some of the lighter meals at all seasons, and for much of the general cooking in summer, when the range is not required to be put in commission for other purposes. For all such purposes, this authority states, electric cooking is not only possible but more attractive and satisfactory, all things considered, than any other method.

Electric Locomotives.

Evidently the electric locomotive is soon to appear on the steam railroad for general use, as well as for hauling trains through tunnels and where smoke and cinders become particularly objectionable. According to a report published in New York, the New York Central company is having several big electric locomotives constructed on plans prepared by a commission of railroad and electrical experts. These machines will weigh nearly 100,000 pounds each, and will possess an indicated horse power of from 2,300 to 2,800, or considerably more than the big steam locomotives which haul the company's fast express trains. It is understood that while these huge electric motors will be available for any service on any part of the Central's system, they will be used at first on the Hudson river division, and presumably in hauling express trains, for they will have a possible speed of seventy-five miles an hour.

Why His Nose Was Red.

A man from Mexico, Jacques Forbes by name, at the Galt house last night, claims to have a typical mother-in-law, inflicted with that strange and almost universal womanly failing of asking promiscuous questions.

"It was only a few weeks ago," said Mr. Forbes, "that a dilapidated-looking tramp, with a long, strikingly red nose,—one of those all-ablaze noses—applied at the back door of my mother-in-law's home for food.

"Sure," said my mother-in-law, in response to his request for food, 'I'll give you something to eat, but my good man, won't you please tell me what makes your nose so very red?'

"Not the least objection, madam," replied the tramp, 'it's simply blooming with pride that it doesn't stick itself into other people's business. Good day, madam.'—Louisville Herald.

A Bachelor's Reflections

Everybody would have a good deal more money if it wasn't any use to him.

The best way to make a girl understand how much you love her is to tell her how lovable she is.

There doesn't seem to be much sense in the way a girl's hair musses up just because you are kissing her.

A bachelor can save a lot of money by spending so much on horse races that he can't afford to get married.

A man thinks he is ambitious to go out into the world and do something when he is only anxious to get a vacation from home.—New York Press.

