Electricity on Common Roads.

The hopes cherished by some electricians as to the possibilities of electrical traction on ordinary railroads are not likely to be fulfilled by the adoption of any known system of electrical working. The most that can reasonably be claimed for existing appliances is the possibility of running a through train from point to point, but the general application of electric traction—involving the fitting up of station yards and branch lines—cannot be entertained by any sober thinking man, and even the partial application to through express passenger traffic is very improbable, for there is not much hope in any system involving a double motive power, electricity for a few special trains and steam for the remainder. There would be no money in such a double outlay.

There is, however, a field for the employment of electricity that appears to present certain possibilities of success and usefulness. We refer to its use on the common roads. Any objections that may be felt to the use of the overhead system in towns lose much of their force when country roads are considered, and there are numerous good roads in the country where, by means of the overhead system, a very considerable traffic could be conducted between towns and villages or outlying places and the nearest railway. The very onerous charges made by the railways of this country for the carriage of farm produce has had the effect of very seriously curtailing the agricultural production of the country in favor of the foreigner, whose product is almost invariably carried by our own railroads for very much less than home produce.

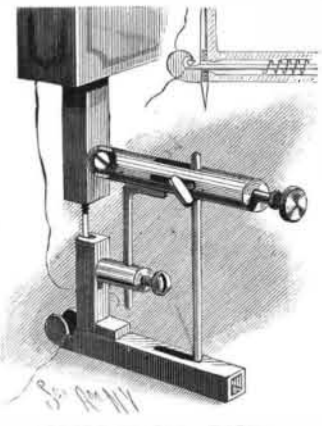
So onerous have the railway charges become—notably on the South-Eastern—that many market gardeners have, we are informed, ceased to use the line and have reverted to the roads, finding that, as compared with the railway charges, they can save both in time and money by doing so. That there must be a screw loose somewhere is evident. Horse traction has no right to be cheaper than steam traction on a railway, and, of course, would not be if the railway directors used their brains. What we should like to see tried is an overhead electrical conductor along some main road to London that is traveled by the market gardeners' vans, such, for example, as the roads from Orpington. The farmers would bring their vans to the line at the home end, and on arrival at the city boundary other horses would take off the vans to their destination, the miles between being covered by electric haulage. A suitable motor would be somewhat upon the lines of the present steam traction engine with the engine removed and an electric motor substituted. The current for such a line could very well be furnished by some existing electric light station, for the haulage is performed, we believe, in the early hours of the morning after the lights are out. The empty vehicles would be hauled back to the country as a day load, reaching home before dark, and thus being entirely a source of profit to a lighting station. Should such a scheme appear to contain the elements of success in its crude form, there is little doubt but that very shortly special motor vans would be built to replace the separate motor. A motor geared down to the axles of the van itself would involve none of the extra weight inseparable from the independent motor, while at the same time a loaded van would have ample tractive weight to draw after it other vehicles. Our English roads are so good that the traction upon them is by no means heavy, and we do not see any very inseparable difficulties in the way of realizing such an idea. Farmers must have horses, and so there would be no difficulty in bringing the loads up to the line any more than there now is in bringing loads to the railway. In many cases, too, there would be nothing to prevent a farmer having a conductor right into his farm when near the main line, and so entirely dispensing with horse traction at the home end. Obviously, the first application of the idea would be upon roads leading out of the large cities some few miles only, but the rapid extension of electric lighting to towns along the roads offers such possibilities of relays that it would frequently happen that a pole line could be carried many miles without such a gap occurring as would demand a special generating station. The outlay on such a scheme would therefore be limited to the poles and conductors, and its financial possibilities would be favorable by reason of the fact that the only power required would come in as a day load and therefore serve to reduce the cost of the electric light stations fortunate enough to be called on to supply the current. —Electrical Review, London.

New Wood Stains.

A solution of fifty parts of commercial alizarin in one thousand parts of water, to which solution of ammonia has been added drop by drop until a perceptible ammonia odor is developed, will give to fir and oak a yellow-brown color and to maple a red-brown. If the wood is then treated with a one per cent aqueous barium chloride solution, the first named become brown and the latter a dark brown. If calcium chloride be used instead of barium chloride, the fir becomes brown, the oak red-brown and the maple a dark brown. If a two per cent aqueous solution of magnesium sulphate be used, the fir and oak become dark brown and the maple a dark violet-brown. Alum and aluminum sulphate produce on fir a high red and on oak and maple a blood red. Chrome alum colors maple and fir reddish-brown and oak Havana brown. Finally, manganese sulphate renders fir and maple a beautiful dark violet-brown and oak a dark walnut-brown. All the colors are said to be very fine.

AN IMPROVED NEEDLE THREADER.

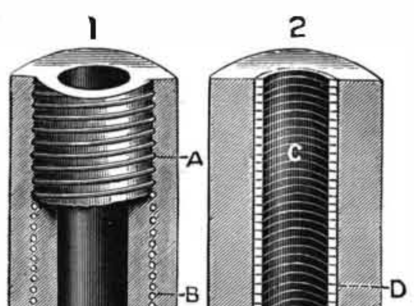
The illustration represents a device more especially adapted for threading needles of sewing machines, being easily applied to the needle bar and needle, and adjustable vertically and laterally to afford a perfect fit. It has a threading hook adapted to positively find and penetrate the needle eye and engage and automatically pull back the thread. The improvement has been patented by Mr. C. S. Goldman, Nos. 21 and 23 Center Street, New York City. Its lower portion has an upwardly extending grooved offset, adapted to receive any needle carried by the needle bar, lips notched to receive the thread extending horizontally on opposite sides to protect the threading hook, the latter having a shank sliding longitudinally in a bore which is reduced and tapered to guide the hook accurately through the needle eye. Extending up from the shank of the hook is a rod whose upper end is adjustably held by a slide block or plunger moving in a hanger tube having an open end adapted to be readily applied to a set screw on the needle bar, although the threader may be used without attaching it to the set screw. The plunger has a shank extending through the back end of the tube, terminating in a finger piece, and is normally pushed back by a spring. Extending down from the hanger tube is a rod adjustably secured by a set screw in a lug at the back of the vertical offset in which the needle is received, thus enabling the lower portion of the threader to be adjusted vertically to bring the hook opposite the needle eye. In operation the thread is laid in the notches and the operator presses on the finger piece, forcing the hook and thread through the needle, the spring carrying the hook with the thread back, so that when the threader is removed the needle is left threaded. A modification of this improvement consists in forming the shank of the hook as the spring pressed plunger, as shown in the small view, a short tube for a support only being then used as the hanger tube.



GOLDMAN'S NEEDLE THREADER.

STRENGTHENING LEAD AND OTHER PIPES.

The illustration shows a method of making lead or other pipes to adapt them to withstand heavy pressures. The improvement has been patented by Mr. G. Wakefield Fox, of No. 104 Dickenson Road, Rusholme, Manchester, England. The invention consists in passing the molten metal through a die and around the end of a core or mandrel and simultaneously feeding a wire into the metal at the die. As shown in Fig. 1 the coil of wire, A, is completely embedded in the wall of the pipe, B indicating the cross sectional area of the pipe occupied by the wire. In Fig. 2 the coil, C, is shown embedded in the inner surface of the pipe. In each case the convolutions of the wire coil are firmly united with the metal.



FOX'S METHOD OF MAKING PIPES.

The English Language.

The principal languages which compete with English, not considering such as Chinese and Hindostanee, are French, Spanish, Russian, and German. French is practically stationary as regards the number of its adherents; Spanish is largely spoken in South America and the southern part of North America, but it owes its prominence to the colonizing genius of its speakers; where German is introduced it rapidly gives way to the native tongue, generally English; Russian, like the German, has little influence upon the Western civilization. It is a remarkable fact that, while the English in their colonies and offshoots have absorbed millions of aliens, there is no record of any great body of English speakers having become absorbed by any other race.

In the United States there are millions of Germans and other foreigners who have become merged with the English speakers in a single generation, they losing even their family names; and the children in many cases do not understand their parents' language. In Canada, however, the French-speaking population is increasing faster than the English-speaking. This is not because the French element absorbs the English, but because it crowds it out. While the French is seldom absorbed by any other tongue, it is almost always absorbed by the English. The English has practically driven the French out of Egypt, and it is rapidly driving the Dutch out of Africa. This has been accomplished in Egypt within a dozen years. The change in Africa is being effected with even greater rapidity. As the English-speaking settlers rush into the new country, the Dutch and other languages, which are rarely to be met with, drop into the backwoods and are finally lost. Africa is witnessing a repetition of the fight of the tongues in America three centuries ago, which resulted in a victory for the English. The history of lingual development in America alone is a sufficient argument for the prediction that no languages, excepting possibly those of the Orient, will long remain formidable competitors of the English.—Troy (N. Y.) Press.

Telegraphic Communication by Induction by Means of Coils.

In a paper recently read before the Royal Society of Edinburgh, by Mr. C. A. Stevenson, the results are detailed of some experiments with the view of establishing communication between North Unst lighthouse, situated on Muckle Flugga, and the mainland, and thence to the lighthouse station at Burrafiord, a distance of two miles. A number of experiments were made in the laboratory to discover the laws of the action of coils on each other, with a view of calculating the number of wires, the diameter of coils, the number of amperes, and the resistance of the coils that would be necessary to communicate with Muckle Flugga, and after a careful investigation, it was evident that the gap of 800 yards could, with certainty, be bridged by a current of one ampere with coils of nine turns of No. 8 iron wire in each coil, the coils being 200 yards in diameter. It was found that 100 dry cells, with 1·2 ohms resistance each and 1·4 volts, gave good results, the observations being read with great ease in the secondary by means of two telephones. The cells were reduced in number down to 15, and messages could still easily be sent, the resistance of the primary being 24 ohms and the secondary 260 ohms. The hearing distance is said by Mr. Stevenson to be proportional to the $\sqrt{}$ of the diameter of one of the coils, or directly as the diameter of the two coils, so that with any given number of amperes and number of turns to hear double the distance requires double the diameter of coils, or double the number of turns, and so on. But this is within certain limits, for when the coils are close to one another the law does not hold. With regard to the question whether or not the parallel wire system is actuated by induction or conduction, it will, Mr. Stevenson says, depend how the ends are earthed, or in short, what is the distance bridged in comparison to the breadth of base, which predominates. Where the wires are long in comparison with the distance bridged, conduction will be the main working factor, but when the base is small, and the distance bridged is large in comparison, induction will be the main factor, and the number of turns then increases the effect.

Improvements in Mantles or Hoods for Incandescent Gas Burners.

L. K. BOHM, NEW YORK, AND T. C. CRAWFORD, NEW BRIGHTON.

The new composition material consists of about 90 per cent of magnesium oxide, about 10 per cent of silicic acid, and about 1 to 2 per cent of an alkali. The silicic acid may be partly replaced by calcium or magnesium phosphate. The most suitable alkali is potassium hydrate or carbonate. The silicic acid may be used as dry powdered SiO_2, but the authors get the best results by employing gelatinous silica. The gelatinous silicic acid is obtained by precipitating a solution of water glass with hydrochloric acid, filtering, and washing. One part by weight of the moist precipitate is well mixed with four parts by weight of a saturated aqueous solution of sugar, and one part of magnesium oxide, and a small quantity of alkali gradually added with constant rubbing. In this way a plastic mass is obtained which may be moulded into the form required for the mantle or hood, or spun into threads and the mantle woven. The hoods are then burned in a baking oven. In this way a mantle or hood is produced such that, while consisting mainly of free magnesium oxide, it is an efficient glow body, contains a skeleton of a double potassium and magnesium silicate giving great stability and hardness.