

Bacteria as Destroyers of Masonry.

Bacteriology has shown how we may count alike upon friends and foes among the myriads of bacteria known to us, says The Lancet. The friendly species, however, are decidedly in the ascendancy, but comparatively few pathogenic organisms having been isolated and recognized. Recent researches have shown how important is the role of the bacterium in many industrial processes, especially where the production of articles of food is concerned. Ascertained facts would seem to teach that bacteria after all may serve us as tiny engineers who can perform stupendous work when associated in myriads, so long as they are placed under a favorable environment. The disposal of sewage by purely bacterial agencies, which under suitable conditions convert an offensive material into simpler and innocuous materials, is perhaps the best case in point. But the disintegrating action of bacteria, though perhaps an indirect one, must, according to recent observations, be reckoned with as a source of mischief. At first sight it would seem hardly possible for bacteria to be concerned in the breaking down of a stone wall, yet such would appear to be the case, according to some ingenious observations directed to the nature of the decay of cement. The gradual disintegration of the cement mortar used in water supply reservoirs is one of the serious troubles met with by water engineers, and a trouble which so far they have not been able to avoid with any measure of practical success. Hitherto this action was supposed to be the result of the solvent property of carbonic acid and other mineral substances commonly present in a water supply. The cement gradually disintegrates and becomes a kind of mud which slowly detaches itself. This strange process is due to the action of none other than that bacterium known as the nitrifying organism. An examination of the mud shows it to be teeming with these organisms. The organism, however, cannot flourish in the absence of nitrifiable pabulum. In its presence, however, nitrous acid is produced, which leads most probably to the disintegration of the cement lining of the water reservoir. The nitrifying organism is the one upon which so much depends in the purification of sewage and effete matters. On this account its growth should be encouraged, and it is curious, therefore, to find that the organism appears as an objectionable factor in the attempt to supply and store an abundance of pure water for drinking purposes.

A NEW RIKER ELECTRIC VEHICLE.

A few months ago we illustrated an electric two-seated open surrey built on the Riker system. Since then an improved form of an electric demi-coach has been constructed, illustrated in the accompanying engraving.

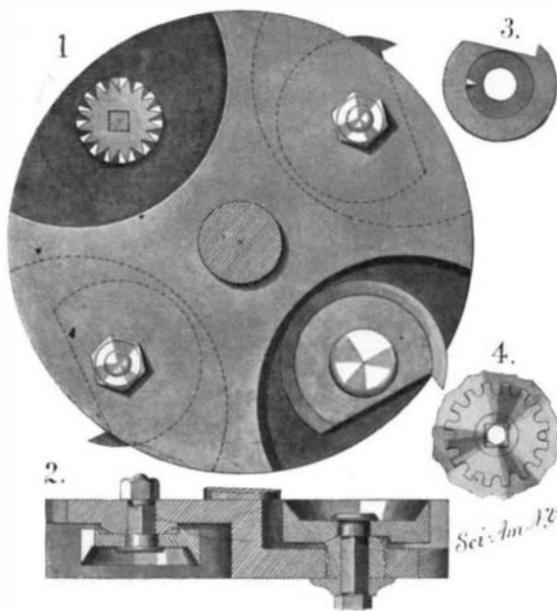
In designing this vehicle Mr. Riker had in mind the needless present custom of locating the driver in front of the vehicle. His idea is to give the occupants a free unobstructed view of the road at the same time protect them, in case of accidental collision, by locating half of the storage battery in the front box-like compartment and the other half in the rear under the driver's seat. This design gives the carriage a symmetrical and well-balanced appearance. The controller lever, steering lever and foot brake are clearly shown attached to the driver's seat. This is wide enough to hold two persons, one for an attendant to open the carriage doors and the other the operator. The vehicle is steered by the movement of the front wheels, connected by a rod to the rear steering lever.

The coach will carry four persons inside, has a full glass front, an electric light in the roof and exterior lamps. It is also elegantly upholstered. The wheels are fitted with solid rubber tires and the rear ones are 42 inches in diameter, and are propelled by 2-kilowatt electric motors, one for each wheel. The total weight of the vehicle is about 4,200 pounds. Attached to the back in front of the operator is the usual combined voltmeter and ammeter. It is intended to travel at a speed of ten miles an hour, and one charge of the battery will carry it 25 miles on a level macadam road. The Riker Electric Vehicle Company, recently organized for the further development of this and other styles

of motor vehicles, has installed a new and extensive plant at Elizabethport, New Jersey, equipped to make every part of a vehicle.

A NOVEL MATCHER-HEAD FOR PLANING MILLS.

A patent has been granted to Charles R. Harvin, of Parkville, S. C., for a matcher-head, by means of which the cutters or bits can be vertically adjusted to adapt the device to different widths of tongues or



A MATCHER-HEAD ROTATIVELY AND VERTICALLY ADJUSTABLE.

grooves. Fig. 1 is a top view of the head with one of the cutters or bits removed. Fig. 2 is a section taken through two adjacent cutters. Fig. 3 is an inner face view of one of the cutters or bits. Fig. 4 is a bottom plan view showing an adjusting mechanism employed.

It is not customary to adjust the bottom cutters or bits vertically; but the upper cutters are, however, thus adjusted to adapt the matcher-head to different thicknesses of floor-boarding or to different widths of tongues or grooves. The means for adjusting the upper cutters or bits will, therefore, be first described.

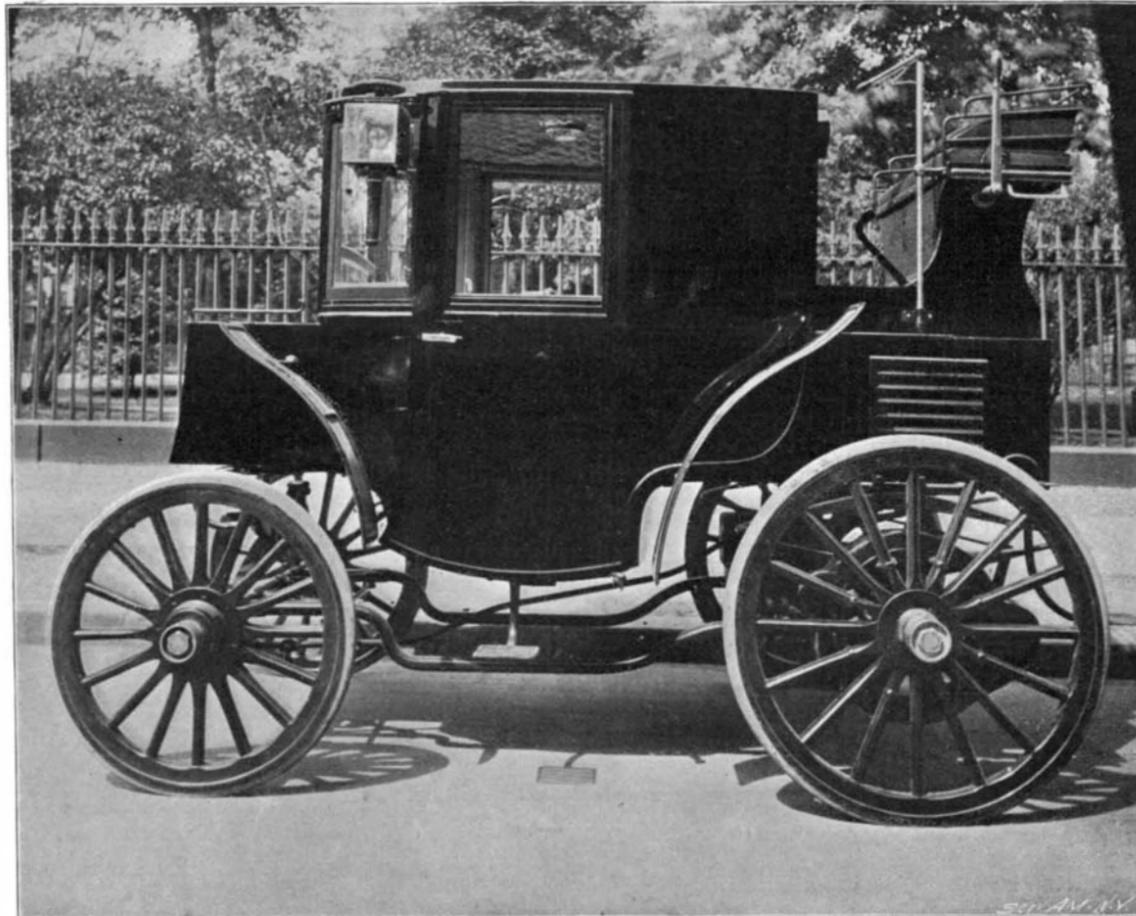
Each upper cutter or bit has a depression in its inner face, at one side of which depression is a tooth adapted to engage one of a series of notches in the upper end of an exteriorly-threaded sleeve. A bolt passes through the cutter or bit and has a portion angular in cross-section passing through a correspondingly-shaped opening in the sleeve. A washer engages the outer end of the angular portion of the bolt and is provided

raise or lower the threaded sleeve. After being vertically adjusted, the cutter is raised to disengage its tooth from the notches in the upper end of the sleeve. The cutter-head may then be rotated to bring its cutter portion outside of the cutter-head, as shown in Fig. 1. When in this position the cutter is lowered to engage its tooth in a notch; the washer is moved to engage the lug, before mentioned, in one of its notches; and the device is tightened by screwing up the clamping-nut.

The bottom cutters or bits also have each a tooth on their inner faces, which is adapted to engage one of a series of notches in a boss on the under side of the cutter-head, so as to hold the head as rotatively adjusted. The bottom bit is clamped by a bolt and nut.

The Comparative Dietetic Value of White and Wholemeal Bread.

It is commonly supposed that wholemeal bread is more nourishing than ordinary white bread because it contains a higher proportion of nitrogenous and mineral substances. But as we have frequently pointed out, says The Lancet, the nitrogenous value of a given food is not necessarily indicated by an empirical chemical analysis. Not all nitrogenous substances are feeding stuffs, and further, it does not follow that the quantity of food partaken of is the quantity of food assimilated. In other words, eating is not necessarily feeding. There are many substances containing a very high proportion of nitrogen which are valueless as food stuffs, and on the contrary there are many edible materials which contain a comparatively small proportion of nitrogenous substances which, however, are completely available for nourishing the organism. We now know that it is not enough for chemical analysis to record merely the proportion of nitrogenous substances; the nature of these substances must be declared, without which the food value of a given substance cannot be estimated. It was formerly assumed that wholemeal bread contained more nitrogen than white bread, but in the light of recent analyses this is not true. Whether or not, however, wholemeal bread is superior as regards its nitrogenous contents, it is certainly inferior as regards its digestibility. This may be attributed in a large measure to the fact that wholemeal bread contains comparatively large, indigestible, and irritating particles of husk. There seems, however, no reason for doubting that wholemeal bread would be much more digestible if the branny particles were finely comminuted. In several patent breads the germ of the wheat is retained, which adds considerably to the nitrogenous value of the bread. But the germ of wheat tends to excite fermentative changes in the "sponge" and produce an unpalatable loaf. Several processes, however, have been devised which avert the possibility of this undesirable effect. We do not believe that with the improvements in machinery generally the dietetic value of bread has pari passu increased. We still hold that a more nourishing article, as it is certainly more palatable, is the old-fashioned farmhouse loaf, which presents a gold wheaten color rather than the blanched appearance which seems to be looked upon as a guarantee of quality in the modern white loaf. Our own laboratory experience, at any rate, shows that probably on account of the increased employment of roller-milling processes the important mineral constituents of white bread have very materially diminished. When it is considered that these constituents play a not unimportant part in supplying the bone-forming factors of the organism, this fact assumes a serious importance and may even throw light upon the prevalence of dental decay. On the other hand, wholemeal bread and germ bread contain an enhanced proportion of mineral salts, such as the phosphates of lime and potash, which are necessary in the building up of the entire human frame.



AN ELECTRIC DEMI-COACH.

with notches in its periphery to receive a lug on the under side of the cutter-head. A clamping-nut on the bolt holds the parts in place. In adjusting one of these upper cutters, the clamping-nut is loosened sufficiently to allow the washer to drop clear of the lug. The washer can then be turned by a suitable tool, its movement being communicated to the bolt, to

THREE thousand five hundred and three vessels of all kinds passed through the Suez Canal last year, and of this number 2,295 carried the British flag. The receipts for 1898 were larger than in any previous year since the opening of the canal.