

pair of stationary supporting wires, acting as rails, with a running endless rope beneath them for giving motion to a succession of carriages; the second, the use of a single endless rope, carried on pulleys at the points of support, both as supporters and transmitters. By either modes a uniform distribution of the load and an important sum total of work are secured.

The working of this experimental half mile having been found so satisfactory, Messrs. Ellis and Everard, of Markfield, have had length of three miles completed, for the conveyance of their "paving sets and road metal" from their granite quarry to the Midland Railway at Bardon Hill. From the *London Engineer*, of the 19th of February, which also contains detailed engineering drawings, we take the following description:—

"This line consists of an endless wire rope, 1½ in. in circumference, supported on a series of 15 inch pulleys carried on substantial posts, which are ordinarily about 150 feet apart, but where necessary much longer spans are taken, in one case, the spans amounting to nearly 600 feet. This rope passes at one of its ends round a Fowler's clip drum, worked by an ordinary portable steam engine, and the rope is thus driven at a speed of from four to six miles an hour. The boxes in which the stone is carried are run on to the rope at the leading end, and off it at the railway by shunt rails, each box having a pair of small wheels to take these rails. Each of these boxes carries 1 cwt. of stone, and the delivery is at the rate of about 200 boxes or 10 tons per hour for the three miles distance. It is almost unnecessary to observe that the proportions of such lines can be varied to any extent to suit the requirements of any particular trade, ranging from 10 tons to 1,000 tons per day. In the case of lines for heavy traffic, where a series of loads, necessarily not less than 5 cwt. to 10 cwt. each, must be carried, as we have before said, a pair of stationary supporting ropes, with an endless rope for the motive power, will be employed; but the method of supporting, and the peculiar advantage of crossing almost any nature of country with a good line, without much more engineering work than is necessary for fixing an electric telegraph, without bridges, without embankments, and without masonry, exists equally in both branches of the system. The cost of establishing these lines will vary considerably in proportion to the quantity they are required to carry, but from their peculiar construction their cost will vary very slightly in relation to the nature of the ground which they may traverse. We have only to add, that the performance of the Bardon line is so satisfactory as to enable both principle and practice to be judged of at once."

We make no apology for so lengthly a reference to this novel and simple mode of conveyance, believing that even in this country it is capable of numerous and economical application, both in manufacturing and commercial operations; and especially when stationary steam motive power is required or in actual use for other purposes.

HOW TO REPAIR A CHAIN PUMP

If the tube has got worn too large for the chain, so it will not raise the water properly, procure some light sole or heavy harness leather, cut into circular washers a trifle larger than the buckets; make a hole or slit in the centre; take the chain apart, and slip on one of the washers next above the bucket, having it fit snugly. There should be only about 4 or 5 to any well, no matter what the depth is, as if more than two in the tube at once when drawing, the suction will be too great. Trial will show how large the washers should be left. A most efficient means of repairing a worn-out establishment.—*Country Gentleman*.

CARBOLIC ACID.

The *Journal of Chemistry* says that two or three drops of carbolic acid to a bottle of ink will prevent mouldiness; and about thirty drops added to a pint of water used for making paste will prevent its moulding. Carbolic acid, however, is a poison, and should be used with care. It is a very destructive to the lower orders of vegetable and animal life.

CHEAP AND EXCELLENT INK.—We clip the following recipe from the *Country Gentleman*:—

Good ink may often be had by paying a good price for it, say about fifty cents per quart; but after the manufacturer has got up his reputation, he is tempted to sell a cheap and miserable article. The best way is for all to make their own ink, and save at least one thousand per cent., as ink is commonly sold at retail, between first cost and final prices. But how shall we make it easily and cheaply? Thus: Buy *extract of logwood*, which may be had for three cents an ounce, or cheaper by the quantity. Buy also, for three cents, an ounce, of *bi-chromate of potash*. Do not make mistake and get the simple chromate of potash. The former is orange red, the latter clear yellow. Now, take half an ounce of extract of logwood and ten grains of bi-chromate of potash, and dissolve them in a quart of hot rain water. When cold, pour it into a glass bottle, and leave it uncorked for a week or two. Exposure to the air is indispensable. The ink is then made; and has cost five to ten minutes labor, and about three cents, besides the bottle. This ink is at first an intense steel blue, but becomes quite black.