

there is also always a back firing in the carburetter when the petrol supply is insufficient. The best way to keep accumulators which are not used regularly is to give them a freshening up about once a week or fortnight by connecting on to a charging dynamo. When treated in this manner very little charging current is required, and the batteries are always kept in excellent working condition, free from sulphating of the plates, and can always be relied upon for use when required.

REPAIRING RADIATORS.

Leaky radiators are not a common complaint, but as they do occasionally occur, as we know to our sorrow, the recital of the means we adopted to overcome a badly-strained tubular radiator will be of interest. It was but a few days ago that we started for the scene of a competition which we desired to witness. The route took us over some exceedingly lumpy by-roads, which, despite good springing, had such a vibratory effect on the radiator, that no less than six of the vertical tubes became loose in the lower tank to such an extent that the water flowed freely from them. The first intimation of trouble was overheating of the engine and steaming at the radiator filling cap. As we were approaching a small town, and could run down hill thereto with the clutch out, we did so before making investigation.

Having pulled up at a convenient place, and made everything right for a good inspection, we got out of the car and took a preliminary walk round, arriving in front of the car, to find the radiator fast emptying itself from unexpected sources. There was nothing for it but to drain the tank, which we did. Then, drying off the water from the tubes, we procured a canful of water from a neighbouring hostel, and filled up again until we had located the faulty tubes by watching the water run from the fractures, which all occurred at the soldered joints of the lower tank. Time and circumstances did not permit of our having the joints re-soldered, so we procured some white lead from an ironmonger, and smearing this on small pieces of rag, laid them round the fractures, previously dried and cleaned, binding each tube round with string, so as to force the coated rag downward on to the tank. When each tube had been so treated, the radiator was filled up with water to test the joints, which were found satisfactory, and packing was introduced at suitable points to brace up the radiator. The journey was continued, and between thirty and forty miles traversed without the loss of more than half a tea-cupful of the cooling fluid.

Napier Automatic Lubrication.

The lubrication of the six-cylinder Napier engine is very interesting and simple in its action. There are no drips in connection with it, and merely one oil gauge, which is situated on the dash.

On the left side of the crank case a small direct acting pump, A, is carried, which is driven by a worm on the half-time shaft, the worm being solid with the shaft. The oil is collected by this pump through a strainer from a well in the bottom of the crank case.

The amount of oil necessary is determined by means of one of the well-known Napier gauge cocks, operated by means of a lever inside the bonnet. The crank chamber is filled up each morning to the correct level, that is until oil runs out of this small gauge cock; when the correct level is obtained, the gauge cock is shut, and the lubrication of the car is right for the day.

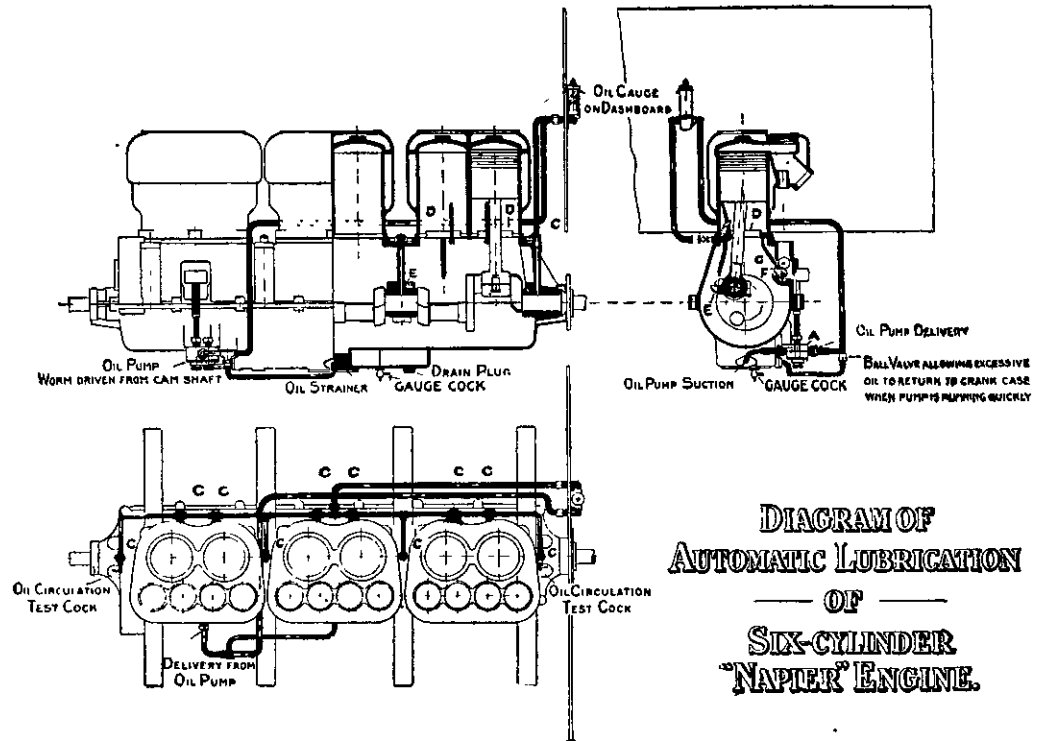
The oil is delivered from the pump by means of a large bore copper tube, which carries it first of all to the dashboard, so that it may pass through the oil gauge, B, and be in evidence to show that it is working properly. It is then led away from

the dashboard, still by means of a large bore copper tube, to the middle of the off-side of the engine, where it meets a T-piece, and is then carried both backwards and forwards, and distributed by means of oil studs, C, to the four main bearings direct, and also a certain definite determined amount is fed to each of the cylinders.

Between the cylinders and the crank case there is a metal shield which limits the splash from the crank chamber to the pistons. This shield having a turned-up lip D, as shown in the diagram, catches the oil, retains a definite quantity always in the groove formed, delivers a portion to the big end bearings, E, and also to the cam shaft, F.

the engine, does away with all drips that may become blocked, and require adjustment, according to the temperature and weather, etc.; it starts when the engine starts, and stops when the engine stops, and the lubrication in every case is directly proportional to the speed of the engine. This is automatically kept correct, and undoubtedly much of the sweetness of the running, and the ability to run fast without deterioration or fuss which these Napier engines possess, is in great measure due to the perfection and certainty of their lubrication.

As to the pressure at which the oil is fed, this, of course, rises with the speed of the engine, but in



The whole of the oil, after being used, drains into the well of the crank case, and after passing through a strainer, is sucked back to the pump. The principle underlying it is a certain definite quantity is delivered continuously to each of the bearings, and also to the cylinders. This eliminates the possibility of a smoking engine, if the detail of having the correct amount of oil in the well is attended to, and this, owing to the Napier gauge, is the simplest thing in the world.

It will be noticed in the plan view that at the termination of the pipes leading to the two main end bearings of the engine, there are two small oil circulation test cocks. These are merely for test purposes, to make sure occasionally that the pipes are quite free. There is, however, scarcely any necessity for these cocks, as the pipes themselves are purposely made of large bore to obviate the possibility of stoppage. Should anything happen to the pump, which would be immediately shown by the oil gauge on the dash, all that is necessary to do is to put more oil in the crank chamber, and lubricate by splash until the pump can be put in order.

The mechanism for oiling the "big end" is shown in section in the small diagram, where the pipe will be seen leading downwards and squirting into the small scoop, carried by the big end, marked E. The pipe leading to the cam shaft is marked F.

The delightful simplicity of the whole system is its chief charm. It is entirely independent of any exhaust or other pressure, is self-contained with

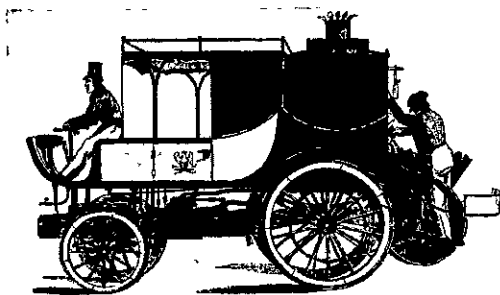
all cases it is sufficient to actually force oil into the bearings, etc., according to the varying conditions. It would be difficult to imagine a more perfect or simple method of lubrication for a motor car engine, and it is merely another example of the care and trouble taken in the details of the Napier engine.

Hard work is not to be classed among the most potent factors in humanity's death rate. Sometimes we tend to look on the dark side of things, and marshal in review the so-called "industrial martyrs" who are exhausting their energies and lives in unhealthy and hazardous occupations.

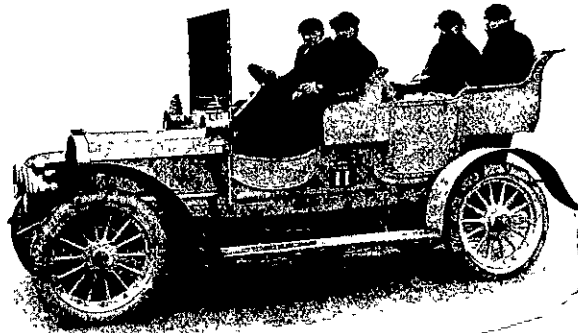
There is, however, a bright side to this as to all other questions. Many occupations—probably by far the greater number in which men are engaged—are, in their very nature, health-giving and stimulating. To mention one, for instance—the making of dye from coal-tar. This is said to be the healthiest trade in the world. Tar, and the odours that come from it, are among the best of tonics and tissue-builders. The average life of a tar worker is eighty-six years, and the mortality in this occupation is eighty per cent. lower than in any other factory trade.

Recent reports published by the Labour Department of the Board of Trade furnish material for comparing the conditions of labour in most of the skilled trades with those obtaining in other countries. As regards the building trades especially, the record is almost uniformly one of advance. The wages current among bricklayers, masons, plasterers, painters, and plumbers show a great appreciation during recent years, both in England and in most of the countries of Europe, as well as in America. In the great cities of Germany and France wages are now only a little below those of London, but in the matter of hours the British workman has a considerable advantage. The paradise of the building trade workers would appear to be the United States. In all great American cities bricklayers earn more than £5 a week. In San Francisco the average weekly wage is nearly £7, but, of course, conditions in that city are just now quite exceptional.

Rest, but do not rust.



1833



1907

The Squire-Macaroni Steam Carriage, built in 1833. This vehicle plied for some time between London and Edgware. It had a multitubular boiler with a fan draught. The boiler was located behind the carriage, a horizontal two-cylinder engine being below the body of the vehicle. The comparison of this antiquated machine with an up-to-date motor car is interesting.