IS THERE A FOURTH DIMENSION?

NEWNES

PRACTICAL MECHANICS

SEPTEMBER

6D.

HOW BRIDGES ARE BUILT

WATER RAISING, THE NEW TELEVISION, FILES AND FILING, PHOTO CELLS AT WORK, OLD WATERLOO BRIDGE, HISTORIC LOCOS., AUTOMATIC SIGNALS FOR MODEL RAILWAYS, PRIVATE HOUSE ELECTRIC LIGHT PLANTS, MAKING CLOCK CHIMES, PICTURES BY WIRE, NEW WIRELESS APPARATUS. ETC.

IS A ROCKET CAR POSSIBLE?

The photograph shows a rocket car capable of travelling between 80 and 90 m.p.h.

The rocket-propelled vehicle has long been a dream of inventors. For ages men have clamoured after a means of locomotion which would do away with gears, pistons, wheel-trains and the like. Hence, from time to time, engineering and mechanical visionaries have toyed with the idea of rocket propulsion as applied to earth-bound vehicles, not only on account of the simplification of mechanism which such a principle of propulsion would involve, but, also, and, perhaps, more particularly, in view of the exceedingly high speeds which any practical system of rocket motive power would bring about.

STRANGELY enough, although the idea of employing the rocket principle as a means of locomotion seems ultra-modern, it constitutes one of the oldest applications of motive power known. The *œolipile*, attributed to Hero of Alexandria about the time B.C. 130, is the first device on record for demonstrating the power of steam. It comprises a hollow metal sphere which is pivoted between two steam pipes rising from a boiler beneath. The steam filling the metal ball makes its escape from two oppositely placed orifices in the latter, thus turning the ball round at high speed.

Now this device is nothing more than the application of the rocket principle, and it was in operation centuries before the principle of the piston was ever dreamt of. In the *œolipile* a gas stream (in the form of hot steam) is forcibly ejected from the metal sphere. Reacting on the surrounding air, the escaping steam tends to push the metal sphere away from it, and in this manner sets up the rotary motion.

A skyrocket functions in precisely the same manner. In this instance, the escaping gas is not hot steam, but expanding gases chemically generated by the combustion of certain materials within the body of the rocket. At the commencement of the rocket's flight the stream of outcoming gases which has been suddenly generated reacts against a very solid base—the ground. This reaction gives motion to the rocket immediately, and the rocket, having once been set in motion, tends to travel upwards in a straight line with steadily increasing motion until the gas stream which it throws out behind it is spent.

Racing Cars

This is the principle which inventors have from time to time endeavoured to apply to the propulsion of cars. Some years ago one or two racing cars in Germany had rocket attachments fitted to them, but these attachments failed to be really practicable.

The actual fitting up of a car with the means of rocket propulsion would not present any formidable difficulty to engineers. The rockets would be electrically fired, and, no doubt, this firing would be carried out automatically. The rockets themselves would be placed in a battery of "firing tubes"—strong steel tubes placed one above the other in horizontal or vertical rows at the back or at the sides of the car. The firing charges of the rockets might easily be manufactured in strengthened cardboard cylinders which would fit in the firing tubes, this construction making for easy replacement of the expended charges. Yes, the construction of an experimental rocket racing car along these lines looks dreadfully simple, but, unfortunately, there are a whole host of objections to be placed against the project. First there is the expense. Well-constructed rockets are not exactly cheap articles, and a battery of twenty or more of these rockets fitted at the rear of the car and lasting, perhaps, from half an hour to an hour in actual use would necessitate an expenditure which would at once preclude such a car from being put to any practical use.

A Disadvantage

Then again there is the fact that rockets are uncontrollable as regards their speed. You may, of course, have rockets containing slow, medium or rapid-burning mixtures, and in this way the average speed of the car throughout its journey could be varied. Nevertheless, so violent is the combustion of the propulsive chemicals contained in a rocket that there would be no means of stopping the action in the event of the driver of the car wanting to slow up.

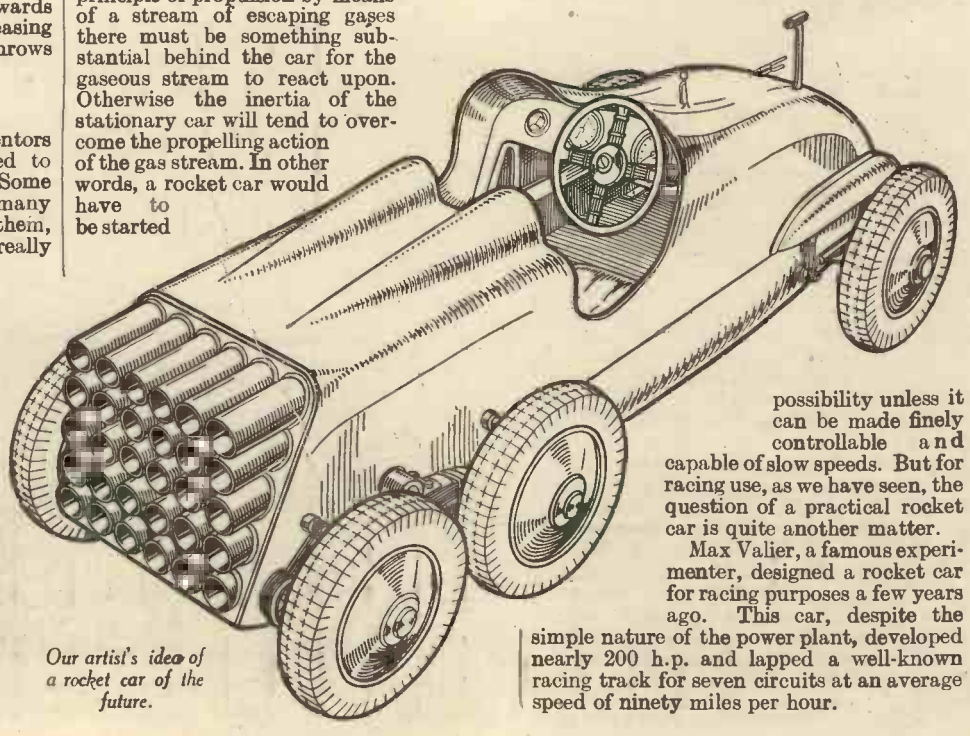
It has been proposed to get over this difficulty by substituting cylinders of highly compressed air for rockets containing combustible mixtures, the compressed air stream being controllable by means of a valve. This method, however, on the score of expense and in view of the enormous weight of the necessary equipment is obviously impracticable.

Again, with any car working on the principle of propulsion by means of a stream of escaping gases there must be something substantial behind the car for the gaseous stream to react upon. Otherwise the inertia of the stationary car will tend to overcome the propelling action of the gas stream. In other words, a rocket car would have to be started from a wall or from some other solid object in order that the gas stream from the rocket apparatus could impinge against it and thus give the car the necessary starting push-off. For racing purposes, however, this difficulty would be overcome without much trouble.

Perhaps in the years to come we shall see some form of controlled rocket propulsion applied to racing cars, but, although it is always dangerous to prophesy in this scientific age, it is difficult to see how the system could be applied in practice to ordinary road cars. For one thing, the escaping gases ejected at the rear of the cars would be not only decidedly unpleasant and inconvenient to other road users, but they would be actually noxious. Indeed, the emerging velocity of these gas streams would be so great that men, horses and other comparatively light road objects would be bowled over at once if they happened to cross the path of the ejected gases.

For Ordinary Road use

Then, of course, for ordinary road use a rocket car would have far too great a normal speed for it to be of any practical value. Imagine a rocket car careering at 60 m.p.h. along the main thoroughfare of your busy town. Imagine not one of these cars, but an average "roadful" of them. Bring considerations such as these to your mind and you will see quite clearly why the rocket road car can never become a practical possibility unless it can be made finely controllable and capable of slow speeds. But for racing use, as we have seen, the question of a practical rocket car is quite another matter.



Our artist's idea of a rocket car of the future.

Max Valier, a famous experimenter, designed a rocket car for racing purposes a few years ago. This car, despite the simple nature of the power plant, developed nearly 200 h.p. and lapped a well-known racing track for seven circuits at an average speed of ninety miles per hour.