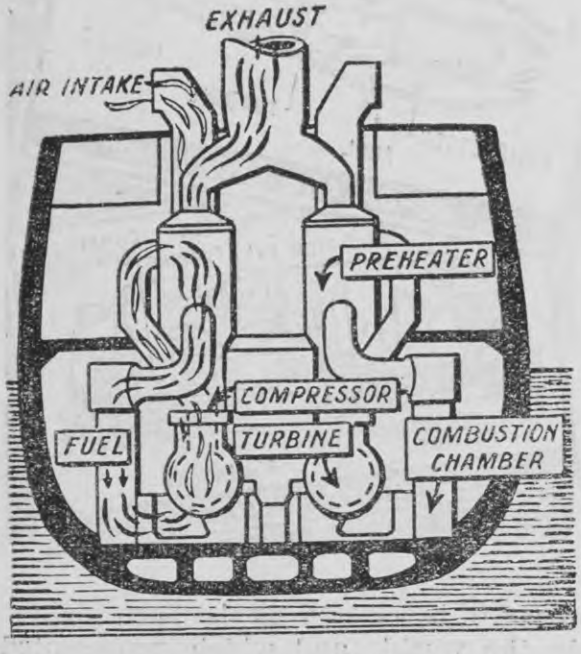
But the gas turbine, despite the wonders of its achievement in the sphere of aerial combat, is still in its infancy, so much so that for the present at least its development has progressed only to the stage where its practical use is limited to power units between a thousand and, say, ten



The application of jet propulsion in the driving of a ship.

thousand horsepower. It therefore becomes apparent that the employment of jet-propulsion in the improvement of the motor car, the power plant of which is small, is still a distant goal, though admittedly within the bounds of possibility. Nor as yet, with the present peak of ten thousand horsepower, is the gas turbine suitable for adaptation to large electric stations, whose power plants call for a higher level of energy.

To the motor car owner familiar with all the ailments of the average automobile—fouled spark plugs, worn piston rings and defective distributors, valves and radiators—the prospects of some day owning a car powered by a gas turbine are dazzling. The principle of jet-propulsion is simplicity itself; with little more in the way of intricacies than in an ordinary windmill, it runs by air. The difference is that in the gas turbine the air goes through a process of compression, is heated in a combustion chamber and then expanded through a nozzle. As applied to an aeroplane, jet-propulsion works like a rocket except that, whereas the rocket carries enough oxygen to burn its fuel, the jet-propelled plane uses oxygen drawn from the atmosphere. Provided it could be fitted with a big enough fuel and oxygen supply a rocket could travel to the moon; a jet-propelled aeroplane could never go higher than sixty-seven thousand feet, where the air is too thin to permit of compression.

No one knows yet whether gas turbines could be made small enough to power motor cars effectively; certain it is that in the present stage of development they would be both delicate and costly. The main difficulty, of course, is metallurgical, and, as metallurgy and design improve, it may be found possible to produce a small, light gas turbine suitable for the motor vehicle, and burning almost any kind of fuel.

Like the steam engine, steam turbine and internal combustion engine, the gas turbine converts heat to power by expanding gases. Whereas the first three also depend upon the pressure of the gases to produce power the gas turbine relies mainly on expansion. Having been compressed, the air flows into the combustion chamber, where its oxygen mingles with the hydrocarbons of the fuel to form a hot flame, and then, heated to a temperature of a thousand degrees Fahrenheit or more, the gas passes through the turbine nozzle, which speeds up its flow in exactly the same way as the nozzle on a garden hose increases the force of water. The hotter the gas the greater its expansion after it leaves the nozzle