hazards are accidents, breakdowns and claustrophobia.

The tunnel will run between Sangatte near Calais, France, and Westenhanger, England, near Dover.

The project has been blocked by technical as well as political considerations since its birth in 1802. A French engineer, Mathieu-Favier, submitted a tunnel plan to Napoleon in which horse-drawn carriages lighted by smoking oil lamps would cross the channel.

It was feared that the oil fumes would asphyxiate the travelers. The tunnel and its massive ventilation problems were forgotten as England and France went to war.

More than 100 years ago, another French engineer, Thome de Gamond, who dedicated his life and entire fortune to reviving the tunnel project, submitted a plan to Napoleon III and the French Government, similar to the Chesapeake Bay Bridge-Tunnel.

His plan called for 13 artificial islands across the Channel to be used as dumps for the excavated material. The islands would have "chimneys" for ventilating the tunnel. Claiming that Channel navigation was bad enough due to frequent storms and fog without 13 artificial obstacles, officials rejected the plan.

Since then the project has run the gamut of everything from submerged, watertight trains to twin dams with a canal in the middle and 1,000-foot-long bridges on either end for navigation.

Politically, the idea has always been blocked by the British, who felt the addition of this "dry border" would ruin their insular security and isolation.

Even after 1909, when the French aviator Bleriot flew across the Channel in a monoplane, the English insisted the tunnel would be the spot for an invasion and envisioned enemy soldiers pouring into London.

During World War I, the British were willing to build the tunnel if its electric power plant were located in England, its entrance placed a long distance from the coast, and constructed in such a way that they could flood it or fill it with poison gas in time of war.

The French were satisfied with a heavy iron door, a half dozen field guns and a number of machine gun nests.

• Science News Letter, 85:218 April 4, 1964

ENGINEERING

Gas Turbine Car Feasible

➤ NEW LOW-COST materials especially developed to withstand high temperatures and stress have played an important role in turning the powerful gas turbine engine or jet aircraft into a practical automobile powerplant.

A series of iron-base superalloys having equivalent or superior life to aircraft type alloys, heat resisting iron aluminum alloys and long life rubbing seal materials that operate satisfactorily from surrounding temperatures up to 1,200 degrees Fahrenheit and above have contributed in turning the "dream car" prophesied for the future into an economic possibility today.

The only gas turbine cars now being produced for experimental test driving by a cross-section of automobile drivers in the United States belong to the Chrysler Corporation. Twenty have been produced so far, of the 50 turbine cars scheduled for consumer experimental use.

The Firebird III, an experimental passenger turbine car built by General Motors, is still in a laboratory experimental stage, as are turbine engines for buses and trucks. The Ford Motor Company is developing a 600 horsepower engine for the U.S. Navy and a 300 horsepower version of this engine for commercial application in trucks.

Although it has no fiery exhaust tail, the gas turbine is a real jet engine. Hot gases generated in the combustion chamber are harnessed by a turbine instead of being shot out the rear as in turbojet planes.

Air taken in from the grillwork at the front of the car is compressed and drawn into the engine's combustion chamber where it mixes with fuel and burns with a very hot flame, expanding the volume of the gas. The hot, compressed air from the combustion chamber then flows over the turbine, an efficient fan that converts the jet blasts to a turning motion, much like a pinwheel in the breeze.

In addition to the new low-cost materials, Chrysler engineers attribute the reality of their car to two other advances in this field. Twin regenerators situated vertically act as heat exchangers in preheating air entering the combustion chamber and removing the heat from the exhaust gases.

Another technical advance is a variable nozzle system that regulates the flow of the gases over the turbine blades. When the driver presses down on the accelerator pedal, the nozzles change the pitch of the blades to increase the efficiency of the gas flow and the speed of the car. The nozzles help solve the problems of braking and acceleration that using a gas turbine engine formerly presented for passenger car use.

The gas turbine car offers to the driver of the future a smaller, lightweight engine, more miles per gallon of gas, the replacement of high octane gasoline by other cheaper liquid fuels, a smooth, vibration-free ride and less maintenance costs. The turbine engine has no pistons and no cooling system.

• Science News Letter, 85:219 April 4, 1964

CHEMISTRY

New Builders' Caulk Does Not Freeze in Cold

➤ "UNFRIENDLY" SILICONE molecules that refuse to lump together and freeze in cold weather have been developed by General Electric researchers in Waterford, N. Y., into a year-round sealing material that spreads like soft butter at temperatures 35 degrees below zero.

Silicone rubber building sealants are used to seal curtain walls, glass, expansion joints and other points in construction.

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