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**Smokeless Powder Looms  
as Propellant for Rockets**

PASADENA, Oct. 14.

F. J. Malina, noted rocket experimenter, told a group of students and scientists at the California Institute of Technology today that the use of smokeless powder, similar to that used in shotguns, but more powerful, appears to be a promising propellant for the sounding rocket.

Most rocket experimenters have concentrated their efforts on the liquid propellant rocket.

Malina said the conclusion was reached after theoretical studies were made together with H. S. Hsien and experimental researches conducted by two Pasadena engineers, John W. Parsons and Edward Foreman, who are working in conjunction with the Caltech rocket project.

The use of powder was first suggested by Dr. R. H. Goddard, who is at present making flights with liquid propellant rockets near Roswell, New Mexico.

"In the powder sounding rocket the powder would be in the form of compressed pellets and would be fed automatically to an explosion chamber from a clip located in the body of the rocket," Malina said. "The chief difficulty would lie in devising a satisfactory reloading mechanism which would press the powder charge into the chamber and close the chamber before combustion took place."

Malina and his associates of the Guggenheim Aeronautical Laboratory of Cal-Tech are testing a rocket motor for use in a sounding rocket using gaseous ethylene and gaseous oxygen for the experiments.

He said today, however, either liquids or some solid propellant, such as smokeless powder, would be used in actual flight—in the case of the former gasoline and liquid oxygen.

Malina and A. M. O. Smith, an associate now working at the Northrup Aircraft Company, calculated a 900-pound rocket which can be shot to about 1000 miles altitude by using a "three step" construction, in which two parts of the rocket would drop away after the fuel in each was exhausted.