The rocket combustor (fig. 3) was composed of an injector with removable faceplates, a cylindrical heat-sink thrust chamber with a 10.77-inch inside diameter and a convergent-divergent heat-sink exhaust nozzle with a contraction ratio of 1.89 and an expansion area ratio of 1.3. The inner surfaces of the mild steel heat-sink thrust chamber and nozzle were coated with 0.030-inch-thick flame-sprayed zirconium oxide to reduce the rate of heat transfer into the metal. This allowed a run duration of 3 seconds which was adequate to obtain the required data.

Injector

A faceplate and cross-sectional views of the 421-element concentric-tube injector are presented in figures 4 and 5, respectively. The faceplates were fabricated from 1/2-inch-thick copper, a material with a good heat-sink capability and good thermal con-