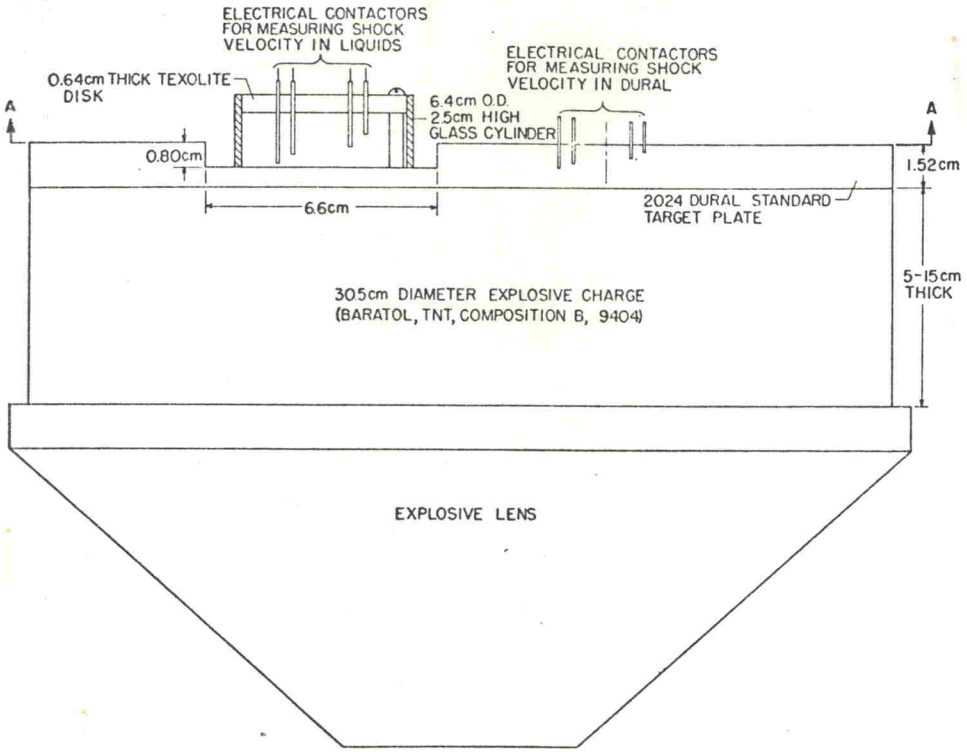

FIG. 2. Cross-sectional view of the shot assembly used for the organic liquids.

must be continuous across the interface between the standard and the material under study. In the above equations P_0 and $V_0(=1/\rho_0)$ represent the pressure and specific volume ahead of the shock front and P and V the pressure and specific volume behind the shock front. U_s and U_p represent the shock velocity and particle velocity relative to the undisturbed material ahead of the shock front. V/V_0 is defined as the relative volume. The curves in the $P-U_p$ plane in Fig. 1 illustrate the impedance match method. The measurement of the shock velocity in the known 2024 dural determines the state P_1, U_{p1}. From this point the reflected Hugoniot curve is constructed and intersects the line of slope $\rho_0 U_s$ determined for the liquid. This intersection is the pressure and particle velocity (P, U_p) in the sample.

The Hugoniot for the 2024 dural has been measured very accurately at ambient temperature. The equation of state[14] is expressed by

$$U_s = 5.328 + 1.338 U_p, \qquad (3)$$

with $\rho_0 = 2.785$ g/cc and the Gruneisen ratio $\Gamma_0 = 2.0$.

A detailed description of the experimental apparatus and fabricating techniques are given in Ref. 15. A cross-sectional view of the experimental apparatus used for the organic liquids is presented in Fig. 2. Three liquids were examined in a single experiment. Each liquid was contained in a glass cylinder set into a well machined in the target plate. The shock ve-

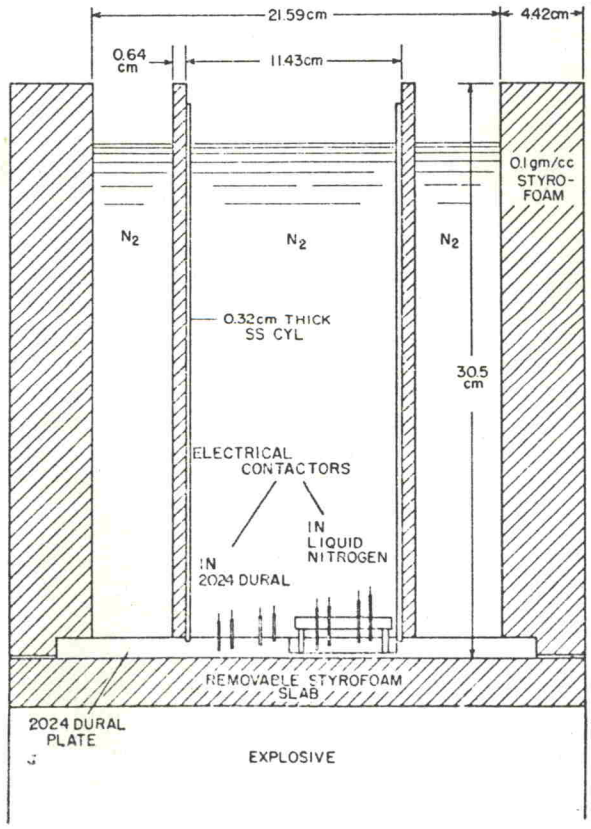

FIG. 3. Cross section view of the apparatus used for the liquid nitrogen.