The angles of the inclined mirrors with respect to the quartz surfaces were measured after assembly by mounting the assembly on a mill table and observing with a telescope the superposition of a cross-hair and its image reflected alternately in the quartz and lucite surfaces. The angles could thus be measured to a precision of 0.1%. Some difficulty was encountered in keeping the lucite mirrors extremely flat. It was necessary to allow angular deviations of up to ± one minute of arc. In each case this amounted to less than 1/2% of the total angle.

In order to obtain the desired accuracy in shock velocity, ± 1%, good contact (0.0002 inch) between the inside edge of the inclined mirror and the outer quartz surface was required. A contact such that no transmitted light was visible was considered satisfactory.

In order to avoid complications due to air shocks the assembly was evacuated prior to firing to a pressure of less than 0.05 torr. A hemicylindrical section of lucite tubing cemented to the aluminum plate served as a vacuum chamber.

A photograph of an assembly, without explosive, prior to firing is shown as Fig. 2.2.

The assembly was viewed through a slit of a rotating mirror streak camera aligned along the centers of the inclined mirrors in the direction of maximum inclination (i.e., the direction in which the mirror angles were previously measured). The slit width was 0.05 mm; the time resolution, determined from the slit width and the camera writing speed (3.81 mm/μs), was approximately 0.01 μs.

Illumination was provided by an explosive argon light source consisting of a 4-inch diameter, 18-inch long cardboard tube with a one-inch pad of composition C-3 explosive at one end. A ground glass diffusing screen was placed over the other end and argon was flowed through the tube continuously.

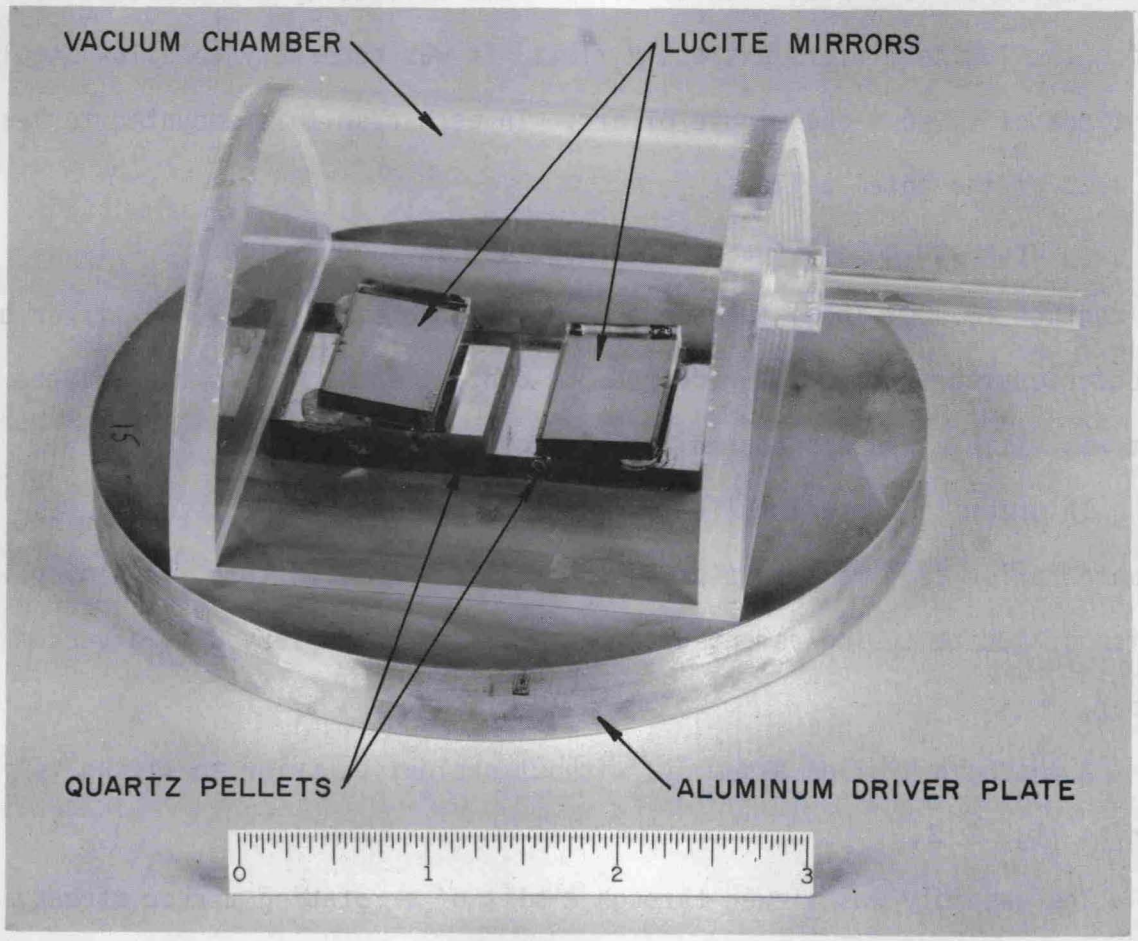

Fig. 2.2.--Photograph of Experimental Assembly