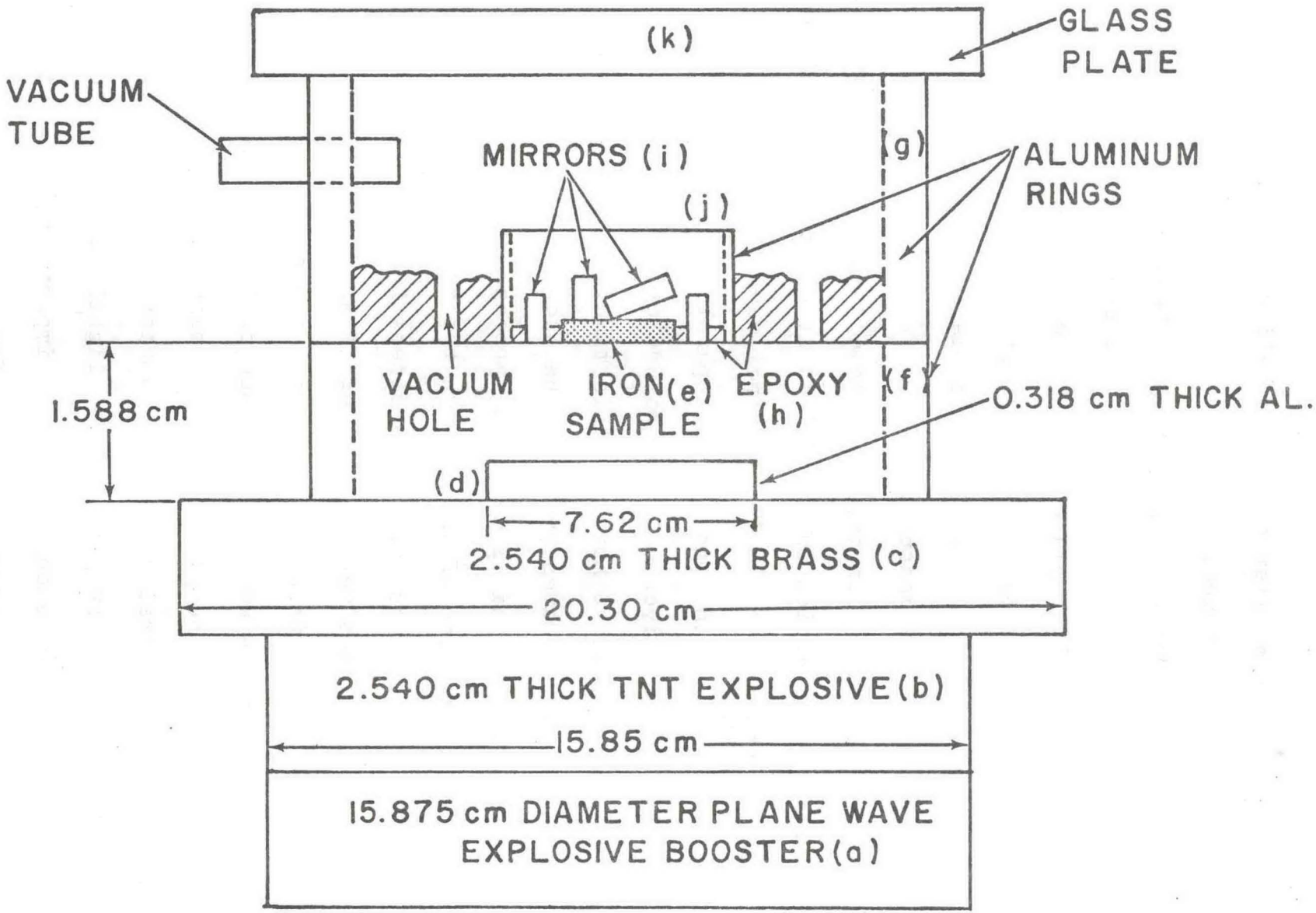

Fig. 3.1.--Flier plate system for plate slap experiments.

Spalling of the flier plate was believed not to occur though this was never proved. A graphical solution,[42] ignoring Taylor relief waves from the explosive gas products, indicates a maximum tension of about 35 kbar is first produced near the rear boundary of the flier plate. Therefore, if the plate spalled near the rear surface, it would not affect the present results because the thicker front of the plate drives the shock for a time ample for all measurements.

A graphical solution treating the elastic-plastic behavior of aluminum was carried out for times $t < d/c$, where d is flier plate thickness, c is longitudinal wave velocity in aluminum, and $t=0$ is the instant of separation of aluminum flier from the brass driver. The magnitude of the tension waves was reduced by at least 6 kbar in this time. The attenuation occurs because elastic waves overtake the slower plastic relief waves. The physics of this attenuating process has been treated elsewhere.[43] At the time of impact with the iron sample the aluminum flier plate is assumed to be stress free.

All flier plates were tilted less than 4×10^{-3} rad relative to the target face. In a special experiment wherein a transparent glass plate was used in place of the iron sample, flier plate impact on the glass plate was simultaneous to 0.012 μsec over a central area with diameter of 30 mm. Flier plate edges arrived at the glass plate slightly ahead of the center portion, but not enough for their impact to perturb the iron samples and interfere with free surface measurements.