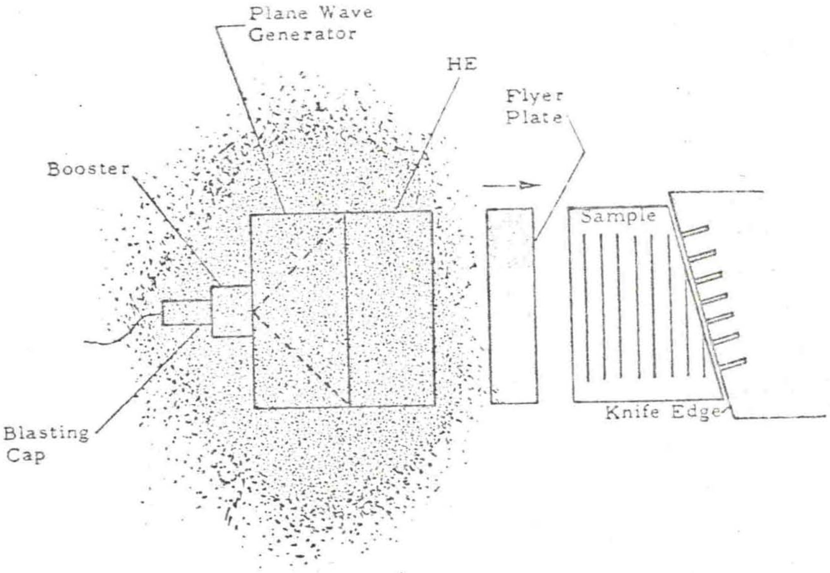

FIG. 1. Configuration for explosively driven flyer plate experiments on wedge-cut samples.

timing sequence was determined by the position of the rotating mirror in the framing camera. Thus, at a predetermined rotor position after detonation of the explosive train, the argon flash was detonated. A gating scheme was used to ensure that the triggering signal generated during each revolution of the camera rotor did not ignite the argon flash until after the explosive train was detonated. The explosive train was detonated when the rotating mirror reached the desired rotational velocity.

A record of the free surface configuration is shown in Fig. 2. From a series of such consecutive records, the shock wave and free surface velocities were calculated.

III. SHOCK WAVE EQUATIONS

In a number of investigations the shock equations have been used. These equations relate the one-dimensional strain and the diagonal stress tensor component in the shock propagation direction to the measurable variables, the shock and material velocities. For a single shock wave propagating into initially unstressed material the stress and strain are

$$\sigma = \rho_0 U_s U_p \tag{1}$$

and

$$\epsilon = \Delta V/V_0 = U_p/U_s, \tag{2}$$

where U_s and U_p are the shock wave and material velocities and ρ_0 and V_0 are the initial density and volume, respectively. The stress σ differs from the hydrostatic stress when the shear modulus has a finite value. For very high stresses the shear modulus vanishes and the diagonal stresses are equal to the pressure. In most of the experiments discussed here the stress level is not high enough to neglect the shear forces so that the value of σ found from Eq. (1) cannot be thought of as the hydrostatic pressure, and shear waves can be expected.

FIG. 2. Sample record of slit area showing intersections of the elastic and plastic waves with the free surface of a granite wedge.