We formulate a problem for the unsteady transonic small disturbance equations that describes the diffraction of a weak shock near a point where its strength approaches zero and the shock turns into an expansion wave. Physically, this problem corresponds to the reflection of a weak shock wave by a semi-infinite screen at normal incidence. We formulate the equations in self-similar variables, and obtain numerical solutions using high resolution finite difference schemes. Our solutions appear to show that the shock dies out at the sonic line, a phenomenon which has not been previously observed. (Received September 17, 2011)