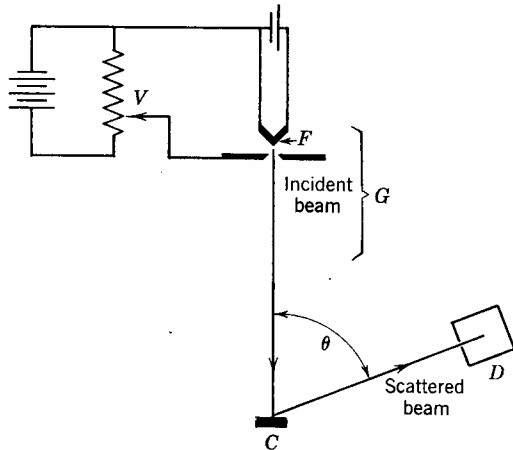


Davisson-Germer Experiment

In order to test de Broglie's hypothesis that matter behaved like waves, Davisson and Germer set up an experiment very similar to what might be used to look at the interference pattern from x-rays scattering from a crystal surface. The basic idea is that the planar nature of crystal structure provides scattering surfaces at regular intervals, thus waves that scatter from one surface can constructively or destructively interfere from waves that scatter from the next crystal plane deeper into the crystal. Their experimental apparatus is shown below.



This simple apparatus send an electron beam with an adjustable energy to a crystal surface, and then measures the current of electrons detected at a particular scattering angle theta. The results of an energy scan at a particular angle and an angle scan at a fixed energy are shown below. Both show a characteristic shape indicative of an interference pattern and consistent with the planar separation in the crystal. This was dramatic proof of the wave nature of matter.

