B. Barrel

The barrel is constructed in four ten-foot sections and one four-foot muzzle section. It was drilled from 4140 HT steel heat-treated to 38 Rockwell C. The sections have bayonet joints at each end and are held together with flanges threaded onto each barrel section with buttress threads (Fig. 5). The flanges are in turn bolted together with eight 3/4", high strength (UNBRAKO) cap screws.

The inside diameter of the barrel is 4.001 $\pm$ 0.001"; the muzzle section tapers slightly from 4.001 to 4.0005" over the last 12". This taper was initially greater but was honed out after test firings indicated excessive friction in the tapered section.

C. Barrel Supports

It was decided to maintain the barrel as torque-free as possible while the projectile was in the gun. Consequently, the barrel rests only on oiled porous bronze bearings constructed as caps for bolts threaded through V-blocks (Fig. 6). These are located at ten-foot intervals along the gun. Although some sagging of the barrel between supports occurs, it has not proved to be necessary to add more supports.

The muzzle of the gun protrudes into the muzzle room; a vacuum and pressure seal is provided by a brass bushing and O-ring. Initially this bushing was made of steel but it was found to seize to the barrel on occasion. No problems have been experienced with the brass bushing.

D. Breeches

Diagrams of the two interchangeable breeches are shown in Figs. 7 and 8. Each contains one cubic foot of gas; the wrap-around model is designed for 6000 psi. They have been tested to 6000 and 10,000 psi, respectively.

In the wrap-around design the projectile seals the ports between the barrel and the annular reservoir by means of O-rings at each end of the projectile. Firing is accomplished by injecting a small amount of high pressure gas behind the projectile, causing it to move past the ports.