

strength of 50000–60000 atm. To ensure that the thrust was applied axially, the piston was mounted in a push-rod *D*, of larger diameter, guided by a cap *E* as used by Poulter (1932). The push-rod was actuated by a 25-ton hydraulic press.

Thirdly, the “unsupported area” seal was modified as suggested by Bridgman (1937*a*), in order to overcome the “pinching-off” effect (Bridgman 1912) in the mushroom stem. Bridgman reported that no difficulty was experienced from failure of the spacing piece *F*, but in our apparatus this proved

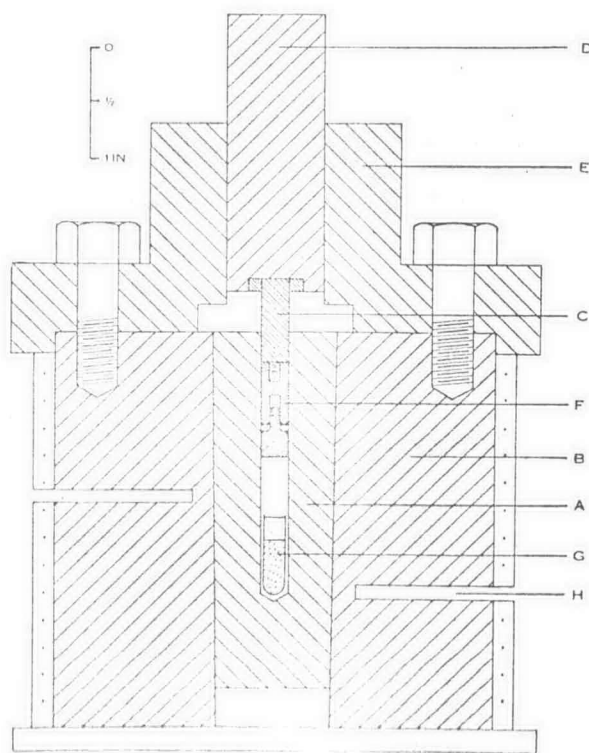


Fig. 2.—The high pressure apparatus.

to be the weakest part. Several types of steel were tried, the most successful being Eagle and Globe “Ultra Capital Plus One” tool steel, heat treated to extreme hardness. Even with this steel, failures occurred above 25000 atm.

The materials used for the other parts of the apparatus were as follows. The pressure vessel *A* and supporting ring *B* were of “Comsteel R4”, the mushroom of “Comsteel R5”, and the push-rod of Eagle and Globe “PRN2” steel. The mushroom was fully hardened and the remaining pieces were quenched from 850 °C and tempered at 200 °C. The tube *G*, containing 0.15 ml of the reaction mixture, was of soda glass sealed by a “Neoprene” plug. It was surrounded by *iso*-propyl alcohol to transmit the pressure from the piston.