of O-rings on the piston depends on the maximum pressure. Each O-ring supports about 2700 atm. At this critical pressure the liquid suddenly leaks through the first ring and fills the volume separating it from the next one. As the pressure is further increased a second leakage occurs at about 5400 atm filling the volume between the first and second O-rings to this pressure and the volume between the second and the third to about 2700 atm. With four O-rings pressures up to 11 000 atm could be securely maintained.

THE PRESSURE-LOCKING SYSTEM is of the same type as described earlier.[1] After mounting the stationary bottom piston, the window pistons, and the sample cell, the vessel is placed in a vertical position and filled with the proper amount of glycerol. The top piston is inserted and its supporting screw, which has a *central bore*, screwed against it. The whole assembly is placed in a hydraulic press, and a steel rod is inserted into the screw bore. When pressure is applied to the protruding rod the top piston is driven down as the pressure increases leaving a space between itself and its supporting screw. After attaining the desired pressure the top screw is screwed tight against the plug. The force on the rod is then relieved and the rod in the screw bore removed. However, the pressure in the vessel is retained by the screws. In fact, it only drops by a few percent due to the yield in the screw.

The cell is now ready to be placed in the optical instrument and the required measurements may be performed. After their completion, the pressure may be increased by repeating the previously described operation, or the vessel may be disassembled by applying again the external force, releasing the screw supporting the piston, which then becomes loose; thereafter carrying out the decompression by a slow release of the external force.

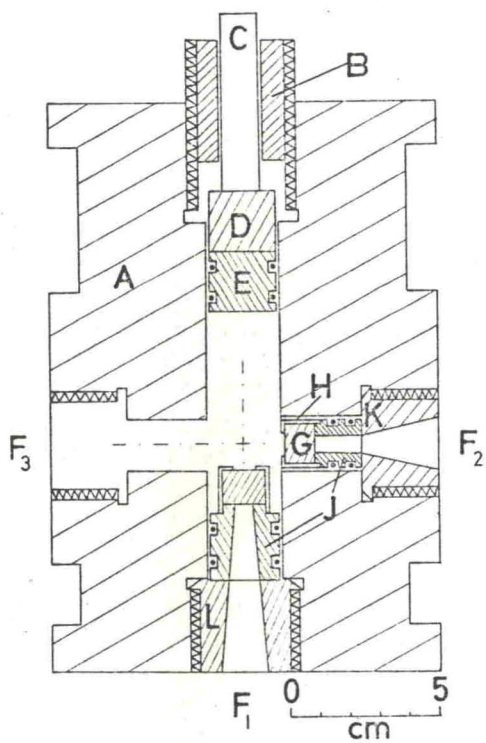

FIG. 1. A high pressure vessel