

The principle of supporting the most highly stressed parts of the apparatus, given a record pressure of 100,000 atm, was also employed by the Soviet physicists Ia. N. Riabinin, L. F. Vereshchagin, and L. D. Livshits. However, their investigations with such apparatus showed that it was very difficult to realize this principle in practice. The main difficulties arose in developing liquid seals, in transmitting information about the investigated phenomena from the double vessel, and in creating thermal insulation when the sample was heated. New means had to be sought.

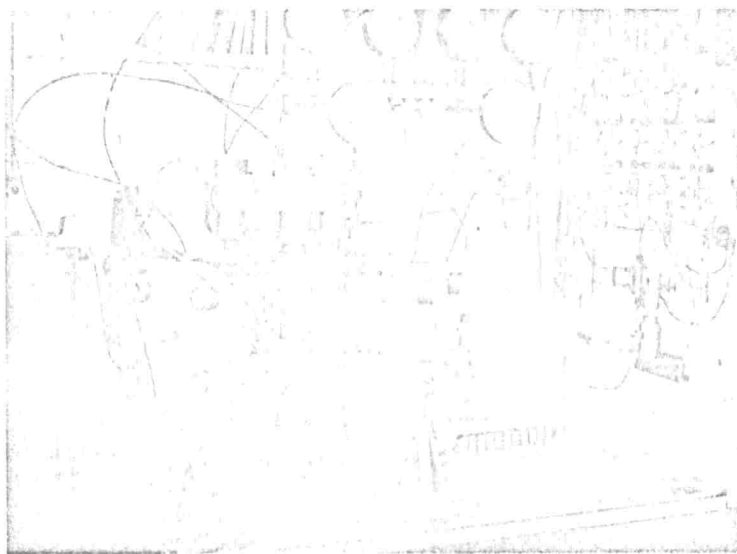


Fig. 2. Press with six hydraulic cylinders

Substantial progress was attained by converting from hydrostatic pressure in gaseous or liquid media to quasi-hydrostatic pressure in a plastic solid. Plastic solids were used as the pressure-transmitting medium, for sealing, and for thermal insulation of the working area in all the methods described below.

Following Bridgman, one may attain very high pressures by compressing a substance between two hard pistons with flat ends (fig. 1c). In this and the other systems shown in fig. 1, the pistons are indicated by the close-hatched lines; as they approach each other, the space