containing the medium (indicated by the dots) that transmits pressure to the investigated substance (indicated by the cross-hatching) decreases. The stationary parts are indicated by the wide hatching. The solid line indicates electric insulation and the arrows indicate the direction of force.

The main disadvantage of this type of device is that only a very small volume of test material can be employed. T. Hall obviated this by using four pistons (instead of two) at tetrahedral angles. With this arrangement, he was able to increase the amount of test substance considerably. Figure 1d shows a three-piston system that elucidates the volumetric four-piston design.

The operation of Hall's four-cylinder press was tested by L. F. Vereshchagin and his associates. They established that the chamber design of this type of high-pressure apparatus was unsatisfactory and that it was very difficult to move the four pistons independently toward the center of the tetrahedron. A slight departure from the given geometry lead to destruction of one of the pistons, and thus, to the appearance of unbalanced moments of force and malfunction of the whole apparatus.

The pistons in the tetrahedral variant of the high-pressure chamber can be synchronized by guiding three of them with a rigid frame (fig. 1e) that moves along a corresponding runner (E. Lloyd et al., and, independently, V. P. Butuzov and colleagues).

The cube and the cylinder are more suitable forms of working space. Figures 1f and 1g show planar systems of compressing a plastic substance with a sample placed inside it, in a cubic chamber. A press with six hydraulic cylinders arranged in opposing pairs along three perpendicular axes (fig. 2) are used to compress the substance.

In view of the structural complexity of this type of press, attempts were made to develop simpler high-pressure chambers with one-cylinder presses.