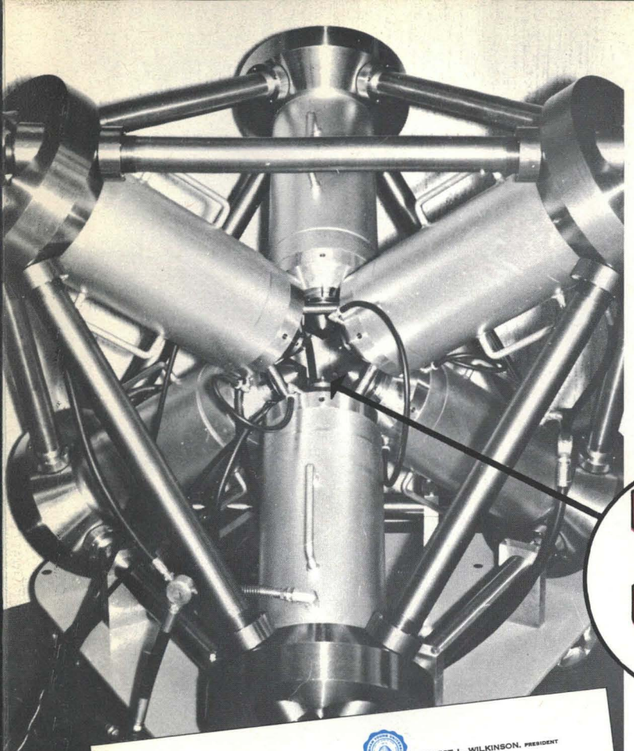
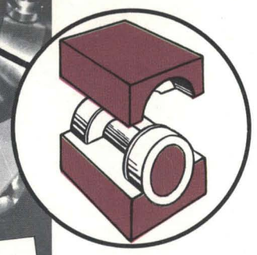
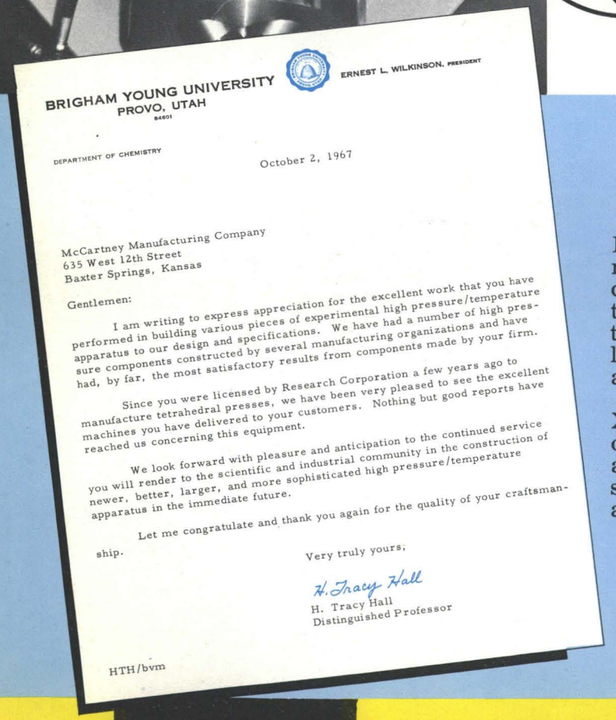


200 TON CUBIC PRESS

Smaller tie-bar type presses are available, such as the 200 ton cubic unit shown at the left. The same basic design is available in tetrahedral configuration. Most research functions can be accommodated with this equipment. The same precision capabilities are available — only the sample size and total force are reduced.



Presses manufactured by McCartney do not require preformed gaskets. The patented anvil guide system maintains relationship between all anvils and permits use of simple sample forms. An artist's cut-away sketch of a pyrophyllite cube with metal heating chamber is shown at the left.



BRIGHAM YOUNG UNIVERSITY
PROVO, UTAH
BA201

ERNEST L. WILKINSON, PRESIDENT

DEPARTMENT OF CHEMISTRY

October 2, 1967

McCartney Manufacturing Company
635 West 12th Street
Baxter Springs, Kansas

Gentlemen:

I am writing to express appreciation for the excellent work that you have performed in building various pieces of experimental high pressure/temperature apparatus to our design and specifications. We have had a number of high pressure components constructed by several manufacturing organizations and have had, by far, the most satisfactory results from components made by your firm.

Since you were licensed by Research Corporation a few years ago to manufacture tetrahedral presses, we have been very pleased to see the excellent machines you have delivered to your customers. Nothing but good reports have reached us concerning this equipment.

We look forward with pleasure and anticipation to the continued service you will render to the scientific and industrial community in the construction of newer, better, larger, and more sophisticated high pressure/temperature apparatus in the immediate future.

Let me congratulate and thank you again for the quality of your craftsmanship.

Very truly yours,

H. Tracy Hall

H. Tracy Hall
Distinguished Professor

HTH/bvm

McCartney has designs available in a wide range of sizes. Either the tetrahedral or cubic configurations can be supplied in the relatively small 200 ton ratings. Designs to 6000 tons are available in the cubic press. Excellent results have been demonstrated in the small as well as the larger units.

X-ray diffraction systems, heating systems and other associated equipment can be supplied in a variety of designs. Your inquiry, indicating specific requirements, will receive our prompt attention.

McCARTNEY

"SERVING THE FUTURE TODAY"
With Extreme Pressure Equipment

Manufacturing Company, Inc.
BAXTER SPRINGS, KANSAS
U. S. A.

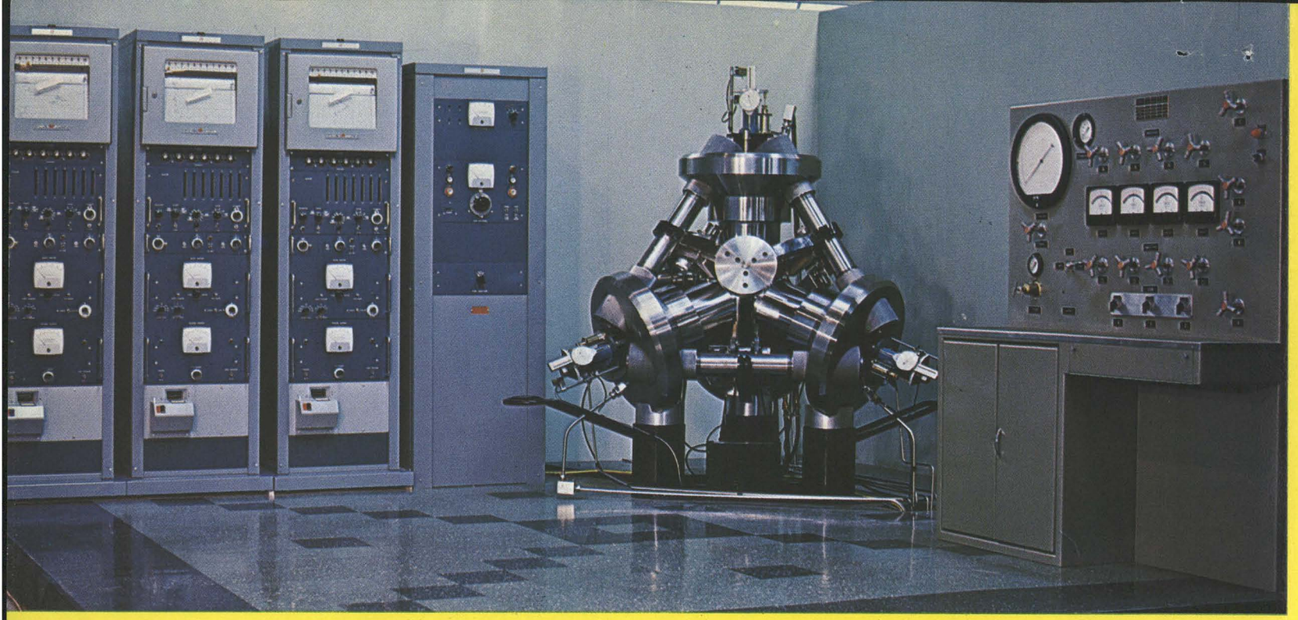
BAXTER SPRINGS, KANSAS
MM CO.

McCARTNEY

TETRAHEDRAL AND OTHER MULTI-ANVIL PRESSES

Designs from 200 to 6,000 Tons

SECTION 800-1
Revised Nov. 1967



600 TON TETRAHEDRAL ANVIL PRESS
and associated x-ray equipment

PROCLAIMED— "The most versatile type of high pressure machine in existence" — the Tetrahedral Anvil Press and associated X-ray equipment permits researchers to observe and measure the changes which take place in the crystal structures of materials under pressures up to 1,500,000 psi (Sodium Chloride Scale) with temperatures up to 1000° C for extended periods of time.

The Press can be a tremendous aid to engineers, geologists, physicists and chemists in observing the behavior of metals, compounds, elements and other substances at these high pressure-high temperature conditions.

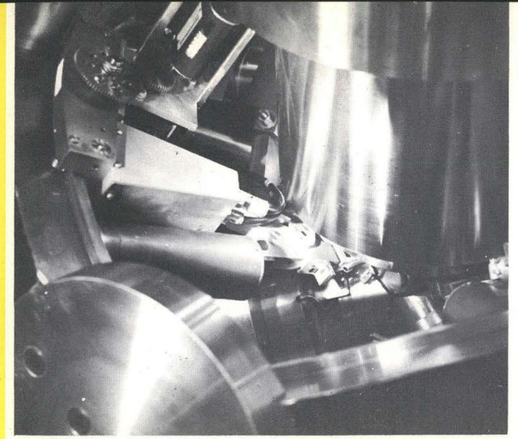
The Tetrahedral Anvil Press and equipment shown above consists of four hydraulically operated rams equipped with carbide anvils, two separate x-ray tube systems, three x-ray detection systems, a high voltage x-ray power supply and a control console.

Boron-filled plastic tetrahedrons are used to encase samples for x-ray diffraction studies. These tetrahedrons have desirable frictional and pressure transmitting properties and are relatively transparent to x-rays. The hydraulic rams, each exerting 600 tons pressure, are brought together so that the anvils form a pressure chamber for the tetrahedron which contains the sample and has been inserted in the press.

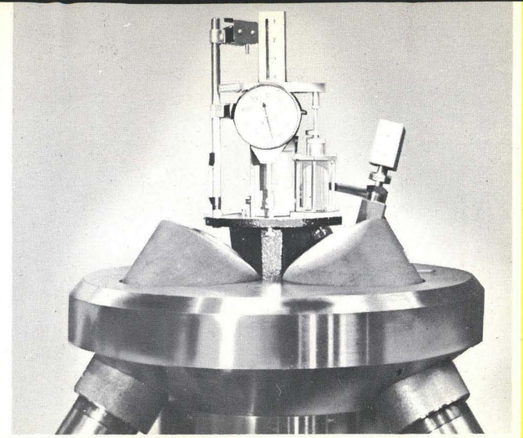
Pressure is increased until the plastic is extruded from the edges of the tetrahedron to form a gasket seal between the anvils.

Two x-ray tubes (one directed between two rams and the other located in a cylindrical cross-axis hole in one of them) with molybdenum targets, are mounted on the press so that x-rays from the sample can be detected from different angles. When the tube in the ram is excited, the x-ray beam passes through a collimator along the axis of the ram and emerges through a small hole in the center of the anvil. As the x-rays from either tube strike the sample, diffracted rays pass out of the pressure chamber through the thin gasket of extruded plastic, and are detected by scintillation counters. Each counter is connected to a strip chart recorder, rate meter and scaler for visual indication or printout of detected signals.

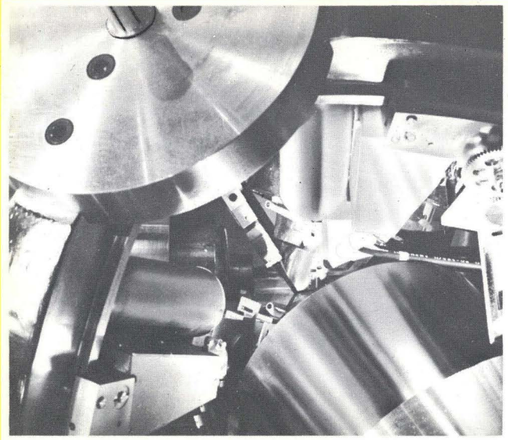
The detectors are mounted on geared carriages . . . one for each axis . . . which move along a circular track to scan the 2 Θ angles characteristic of x-ray diffraction. Each of the scanning tracks lies in a plane which passes through the axis of the x-ray tube ram and the axis of one of the other three rams.



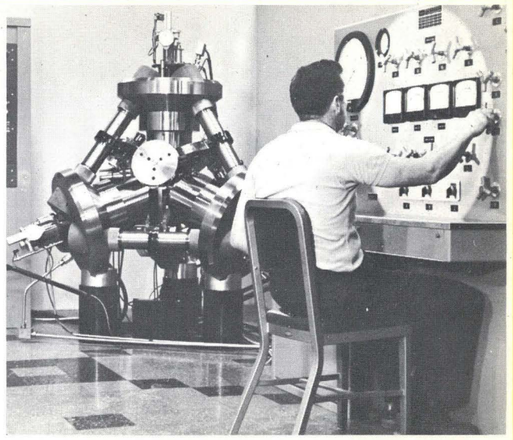
X-ray preamplifier unit and carriage, as well as three anvils in the center extending from the high pressure cylinders.



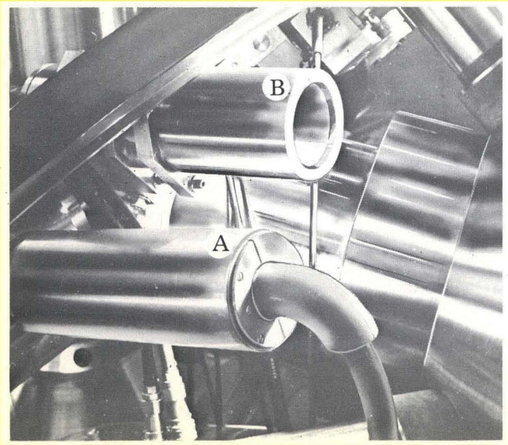
Top ram base and the indicator for locating the anvil position from center reference point.



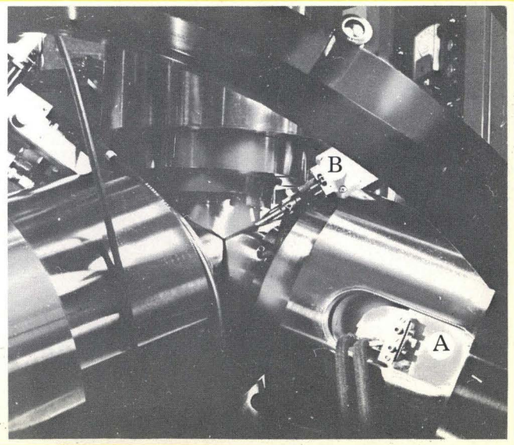
The optical piece used by the operator to visually check the alignment of the anvils, is shown at the top right.



Operator utilizing remote hydraulic control at the control console for positioning the anvils in the press.



Two x-ray tube mountings, lower (mount "A", goes through the piston and up to the sample.



X-ray tube mountings from opposite side of photo No. 3. The upper (mount "B") has a collimator directed between the anvils to the sample. Lower (mount "A") shows x-ray tube mounted in the piston. Photo also shows optical piece for center alignment of anvils.