

for Progress—Maurice U. Ames, Arthur O. Baker and Joseph F. Leahy—*Prentice-Hall*, 2nd ed., 416 p., 433 p., 610 p., illus., \$4.95, \$5.15, \$6.55. High school textbooks.

TRANSISTOR CIRCUIT ANALYSIS—Maurice V. Joyce and Kenneth K. Clarke—*Addison-Wesley*, 461 p., \$10.75. Presents basic methods of analysis involved in the design of junction transistor circuitry. A senior-graduate level text and reference volume.

A TREATISE ON THE DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES—Luther Pfahler Eisen-

hart—*Dover*, 474 p., illus., paper, \$2.75. Introductory text for graduate students first published in 1909.

ZOO-MAN STORIES—T. H. Gillespie—*Taplinger*, 121 p., illus. by Len Fullerton, \$2. Talks about animals broadcast in the Children's Hour of the Scottish B.B.C.

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• Science News Letter, 79:76 February 4, 1961

INVENTION:

Patents of the Week

An exhaust nozzle with curved ridges reduces jet noise. A compact nuclear power plant will produce steam for a turbine producing electricity.

► THE IRRITATING NOISE of a jet engine can be effectively reduced by an invention just patented. This noise, a big problem in the present jet age, is especially irritating when jets take off, releasing a flood of complaints from neighbors living near the airport.

The invention is an exhaust nozzle with a series of curved ridges and grooves along its inner cone. Jet gases passing through the nozzle are broken up into many small air streams that flow along the ridges and grooves. When the streams reach the open air, they mix together, reducing the noise level.

The loss of jet thrust caused by reducing the sound is very small, according to California inventors Kenneth W. Goebel of San Diego, and Lanvin G. Pierce of National City.

The invention also provides a device for slowing down a jet plane just before landing so that it will not need such a long runway.

Two deflectors, attached to the exhaust nozzle, capture the swiftly passing outside air, diverting it into the jet exhaust. This causes a reversal in air flow, producing a braking action.

When the deflectors are used, they form a metal "parachute" that collects the outside air. If they are not needed, they fit snugly over the pod surrounding the engine.

The rights to patent No. 2,968,150 were assigned to Rohr Aircraft Corporation.

A combination jet engine with the advantages of two different types of jet propulsion won patent No. 2,968,146 for Alun Raymond Howell and Charles Ernest Moss, both of Cove, England.

The engine can be converted from a turbo-rocket to a ram-jet propulsion system, depending upon the need of the aircraft. The turbo-rocket system, which is normally used for take-offs, has a bladed compressor that is unnecessary in ram or "pulse" jet engines. When the blades are withdrawn from the path of the incoming air, the engine becomes a pulse jet system capable of very high speeds.

The inventors assigned the patent rights to Power Jets Limited, a British company. Another new patent is a compact nuclear

power plant designed to heat water or heavy water to produce steam for driving a turbine that will produce electricity. The power plant, patent No. 2,968,602, combines advantages of conventional power reactors that require a heat exchanger to produce steam for power and those in which steam is generated in the reactor proper, both of which require extensive shielding of numerous external pipes and auxiliary equipment outside the reactor itself.

The new reactor, invented by Ernest Loeb of Silver Spring, Md., and with patent rights assigned to the Atomic Energy Commission, places the reactor and turbine inside a single housing case, in which the reactor functions as the turbine rotor. The reactor control system requires only one moving part, a valve mechanism which controls the feed water going into the reactor.

Mr. Loeb states that the invention "achieves the nearest approach to the direct conversion of nuclear to mechanical energy presently known."

A push-button method for finding out from a distance whether or not there is mail in the mail box got patent 2,968,804 for Raymond F. Buffington of Manhattan Beach, Calif.

The device essentially is an electric eye that scans the box when a switch is turned on in an apartment or farmhouse. If there is mail, the eye sends back a signal that might be a buzz or a flashing light. No signal means no mail and a fruitless trip to the box is eliminated.

Philip H. Corbett and James Brace of Prairie Village, Kans., have invented a foot-steering apparatus for outboard motor boats. Designed to allow a fisherman to steer the boat by foot while both hands are occupied reeling in the fish, patent No. 2,968,273 consists of a foot pedal that is connected to the lever arm of the motor. The device was assigned to Brace and Corbett, Inc.

For bowling fans, Arno A. Tessman of San Antonio, Texas, has invented a device to help them bowl a better game. The device, awarded patent No. 2,968,101, is a bowling ball with an adjustable grip. By merely adjusting the pressure, the most comfortable holding position is obtained.

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