

parts. When traveling through the atmosphere, it operates only after acquiring enough speed from some other source to pick up sufficient air under pressure to produce combustion with fuel fed into its tapering cylinder. In the afterburner the oxygen for combustion is provided in the exhaust from the turbo-jet itself.

*Science News Letter, May 22, 1948*

## METALLURGY

## German Magnetic Alloy Now Made in America

➤ A FORMER German magnetic alloy, particularly suitable for use in rectifiers to change alternating electric current into direct current, has now been produced for the first time in the United States at the Naval Ordnance Laboratory, White Oak, Md., the Department of the Navy revealed.

This valuable alloy, known as Permenorm 5000-Z, is a result of a fusion of nickel and iron under an intricate heat-treatment process. It was first made in Germany in 1943, where it was applied in the electrochemical industry in the construction of huge rectifiers.

Unfinished samples of the new alloy were brought to this country after the close of the war by American scientists, and distributed to American governmental and industrial laboratories to be duplicated for domestic uses. Although details of the process were available, no laboratory until now was successful in producing the type of alloy which had the required magnetic properties.

Permenorm 5000-Z has important applications in the fabrication of magnetic amplifiers to give additional strength to feeble electrical pulses. Employed for this purpose, it may replace many of the complicated, delicate and troublesome electronic tube amplifiers now used in guided missiles, equipment to control gun firing, and underwater ordnance.

Credit for the reproduction of the alloy and its new applications goes to Dr. Gustaf W. Elmen and Edward A. Gaugler, physicists at the Naval Ordnance Laboratory. Dr. Elmen, well-known as the inventor of other magnetic alloys, served as consultant, while Mr. Gaugler was actively in charge of the project. At a scientific meeting to discuss magnetic materials, to be held at the Naval laboratory in the near future, the Permenorm development will be described at length.

*Science News Letter, May 22, 1948*

## MEDICINE

# Hope for Amputees

New suction socket makes walking more comfortable and easy for those who have lost legs. New arms make it possible to shave self or drive truck.

See Front Cover

➤ SUCTION SOCKET that makes an artificial leg feel like part of the amputee's own body. A hook so controllable that it can pick up a marshmallow or a hamburger. A natural looking dress hand, with thumb motion, that will cost a fourth or a sixth the price of present motionless dress hands.

These are among the new artificial arms, legs and hands and hooks demonstrated at the National Academy of Sciences. They were developed by governmental, industrial and university laboratories in a program sponsored by the Army, Navy, Air Forces and Veterans Administration and coordinated by a National Research Council Committee.

Certificates of appreciation were presented in Washington by Secretary of the Army Kenneth C. Royall to 15 of 27 amputees who have tested the devices and made valuable suggestions for improvements. The other 12 are receiving their certificates at ceremonies in other parts of the country.

At least 200 of the suction sockets have already been successfully fitted. The second phase of the experimental program, now being started, will supply about 450 more. The socket holds the leg on by suction, created by the intake and outgo of air as the amputee walks. It replaces the heavy belt around the hips now used to hold on artificial legs. Besides feeling comfortable, the suction socket actually builds up the leg, or stump, in contrast to the pale, anemic condition that may develop with present leg attachments.

The young veterans shown on the cover of this week's SCIENCE NEWS LETTER are demonstrating that with the new leg it is possible to put the weight of the body on the artificial leg when going downstairs. This has been impossible with the older types, as has also putting the foot flat on the step. Suction socket with combination valve and knee flexion and ankle rotation with some lateral motion make this possible.

"The hook of the future" is the en-

thusiastic description given by Pfc. Leo J. Qualiotto, Cleveland, to the one that picks up a marshmallow. Mr. Qualiotto has been testing hooks, hands and arms since October, 1946. Officially it is known as the Army Voluntary Hook. Its advantage is that the user can control the closing and pressure of the hook, using whatever degree of grip he wishes.

The dress hand with movable thumb

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