

ENGINEERING

Flaws Accurately Located

► AN AMERICAN pastime familiar before the days of movies and radio has been resurrected by science as the fundamental principle of a new method for detecting flaws in metal castings and blocks by stereoscopic X-ray pictures. Each stereoscopic picture is made up of two photographs taken from slightly different angles, so that when they are viewed through the two lenses of a stereoscope, they appear to have solidity and relief. They are commonly called three-dimensional pictures.

The stereoscopic method of exposing two separate films overcomes the decreased sensitivity inherent in double-exposure X-rays, where both pictures are made on one film, James Rigbey, radiologist of the Ford Motor Company of Canada, Windsor, Ontario, told the convention of the American Society for Metals in Cleveland. Sensitivity is improved by the stereoscopic method from 4% to 1%, while the maximum possible error in the actual measurements is calculated at about 14%, he stated.

In use, the new method consists of making two X-ray pictures of a specimen metal casting or block, using a slightly different position of the X-ray tube for each picture, so that the images of the specimens on the films are in relatively different positions, depending upon their relative distances above the film. Therefore the image of any flaw or defect in the specimen undergoes a shift on the second picture taken, relative to the first. The magnitude of the shift depends upon the shift of the X-ray tube, vertical position of the flaw in the specimen, and the focal distance, Mr. Rigbey explained.

Precise measurements can be made of the shift of the image to determine

the vertical position of the defect by using a lead marker placed in exactly the same position relative to the specimen, usually attached to the specimen itself with cellulose tape, he stated.

A special graph has been developed to aid interpreters in their study and analysis of the stereoscopic pictures.

X-ray interpreters play an important role in modern industry. It is their responsibility to examine raw parts such as castings with X-ray equipment to see that they meet specific quality standards so that no unserviceable part, that might break down or fail when in use, gets into a finished product. The decisions made by the interpreter can also mean the difference between profit and loss for the producer of the raw parts.

Pointing out that the existing published standards for X-ray interpretation are very meager, Leslie W. Ball, assistant technical director of Triplett and Barton, Inc., Burbank, Calif., recommended to the meeting a system of identifying radiographic images with metallurgical defects and methods for determining the acceptability of defective parts. He also urged the more rapid development of professional status and recognition for X-ray interpreters.

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CHEMISTRY

Alkali-Chlorine Industry Active During Past 100 Years

► THE active 100-year history of the unheralded, though vitally important, caustic soda-chlorine industry in the United States was reviewed by L. D. Vorce, chemical engineer, of the Westvaco Chlorine Products Corporation, New York, at the meeting of the Electrochemical Society in Buffalo.

It was only 144 years ago that Cruickshank, a British scientist, discovered that electric current breaks up common salt into alkali and chlorine. This discovery laid the foundation for the electrolytic caustic soda-chlorine industry that in 1941 produced 677 tons of caustic by the process.

The first patent for an electrolytic process was issued in the United States in 1883, Mr. Vorce revealed. The process was never tried out, and many subsequent patents which were awarded on similar processes proved to be failures commercially. The first plant using the

electrolytic process was built at Rumford Falls, Maine, in 1892, under the direction of Ernest A. LeSueur who started designing his process while still a student at the Massachusetts Institute of Technology. The LeSueur process continues to operate successfully to this day, Mr. Vorce stated.

Since the first patent was issued, nearly 350 patents have been taken out on electrolytic caustic-chlorine processes. Of all these only about 32 have been tried out commercially, and only 16, less than 5%, have stood the test of time and continued to operate, Mr. Vorce remarked. He added that many of the cells might have succeeded if given a fair chance and with sufficient financial support.

Before the war, he declared, there were more than 40 electrolytic caustic-chlorine plants operating in this country. The demand for chlorine by the government for wartime use has resulted in seven additional plants being built.

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PHYSICS

Better Television Foreseen As Result of New System

► BETTER television is promised in a system wherein the effect of increased sensitivity of an electronic scanning tube of the cathode ray type may be obtained, and on which patent 2,359,449 was awarded among the 453 patents of the week. The patentee is Robert E. Selby of Teaneck, N. J., and the patent has been assigned to the Radio Corporation of America.

In his television scanning system provision is made for ways and means by which the time period between scanings is lengthened out, thus increasing the effective sensitivity of any given area of mosaic electrode in the tube. A pair of image scanning tubes are used, each adapted to receive light images substantially alike, and also switching means for alternately rendering the independent scanning tubes and the associated preamplifiers operative and inoperative.

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A 614-gram gold nugget was recently found near Las Noches, Chile; a 500-gram nugget was found in the same locality a month earlier.

Turkey will be furnished overseas service men again this winter for Thanksgiving, Christmas and New Year's; a set-aside order already has been issued by the government to turkey raisers.

MATHEMATICS DICTIONARY

Second Printing, Second Edition

American Library Association's Subscription Books (encyclopedias, dictionaries, etc.) Committee says in Subscription Books Bulletin, Oct. 43: "In its subject field there is no work directly comparable to the Mathematics Dictionary. Because of its usefulness to anyone seriously interested in mathematics, the volume is recommended for personal, school or library purchase. For those already possessing the 1942 edition, purchase of the 1943 edition is suggested only if the dictionary is extensively used or a second copy is desired." Send \$3.00 to Digest Press, Department 3B, Van Nuys, California, or Science News Letter.