Yanulova, M. K.

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 7,
                    P 91 (USSR)   15-57-7-9370

AUTHORS: Yanulova, M. K., Potok, S. I.

TITLE: A Bismuth Mineral in the Karagayly Deposit (O vismu-
                tovom minerale Karagaylinskogo mestorozhdeniya)

PERIODICAL: Izv. AN KazSSR, ser. geol., 1956, Nr 25, pp 100-106

ABSTRACT: Aikinite has been identified in the mineralized skarns
                of the Karagayly lead-zinc deposit. The mineral
                forms elongate-prismatic crystals with longitudinal
                striations and without terminations. The crystals are
                commonly fractured, broken, bent, or twisted. Indi-
                vidual crystals or grains reach a length of 10 mm and
                a cross-sectional diameter of 2 mm. The mineral is
                silvery blackish gray; its luster is strongly metallic;
                its hardness is 2 to 2.5, and its specific gravity
                6.9 to 7.16. Microscopic study has shown that its

Card 1/2

reflecting power is equivalent to that of galena, but the color is
a scarcely detectable yellow. The relief is almost the same as for
galena. The variation in reflection is weak, but the mineral is
clearly anisotropic. Anhedral and elongated grains are distin-
guished under the microscope. The mineral effervesces in HNO_3 and
turns black. It contains Bi 30.4 percent, Pb 39.3 percent, Cu 10.4
percent, S 15.7 percent, SiO_2 3.2 percent, CaO 0.4 percent: total
99.4 percent. In a garnet skarn body, the aikinite forms large,
irregular, locally rather thick disseminations, most commonly
associated with nests of sphalerite and segregations of chalcopy-
rite. In zones of wollastonite skarns, it forms small, uniformly
thin disseminations. In veinlets and nests of quartz, the aikinite
is found in idiomorphic crystals with a well-developed prismatic
zone. The mineral is associated with sphalerite, chalcopyrite,
galena and, rarely, bornite and other minerals.
Card 2/2

K. N. Ryabicheva

SATPAYEV, K.I.; BORUKAYEV, R.A.; AKHMEDSAFIN, U.M.; BOK, I.I.; KUSHEV, G.L.;
SERGIYEV, N.G.; SHLYGIN, Ye.D.; SHCHERBA, G.N.; MONICH, V.K.;
LOMONOVICH, I.I.; LAVROV, V.V.; MEDOYEV, G.TS.; NOVOKHATSKIY, I.P.;
BARBOT-DE-MARNI, A.V.; GALITSKIY, V.V.; KOLOTILIN, N.F.; ZHILINSKIY,
G.B.; KAYUPOV, A.K.; KAZANLI, D.N .; SATPAYEVA, T.A.; ABDULKABIROVA,
M.A.; GAZIZOVA, K.S.; VEYTS, B.I.; KHAYRUTDINOV, D.Kh.; MUKHAMEDZHANOV,
S.M.; CHOLPANKULOV, T.Ch.; PARSHIN, A.V.; TAZHIBAYEVA, P.T.; YANULOVA,
M.K.; BYKOVA, M.S.; VOLKOV, A.N.; BOLGOV, G.N.; MITRYAYEVA, N.M.;
CHOKABAYEV, S.Ye.; KUNAYEV, D.S.; YARENSKAYA, M.A.; REBROVA, T.I.

Tireless explorer of the depths of the earth's crust; on the 65th
birthday and 40th anniversary of the scientific engineering ac-
tivities of Academician M.P. Rusakov. Vest. AN Kazakh. SSR 13
no.12:96-97 D '57.   (MIRA 11:1)
                    (Rusakov, Mikhail Petrovich, 1892-)

MUKANOV, K.M.; FURSOVA, M.Z.; YANULOVA, M.K.

Plattnerite from the oxidation zone of a lead-barite deposit of
Karagayly. Vest.AN Kazakh.SSR 17 no.1:45-52 Ja '61.
(MIRA 14:1)
(Plattnerite)   (Kazakhstan—Lead ores)

YANULOVA, Marina Konstantinovna; BOK, I.I., akad., otv. red.; SOKOLOV,
A.G., red.; ROROKINA, Z.P., tekhn. red.

[Mineralogy of the Karagayly skarn-barite-complex ore deposit
(Central Kazakhstan)] Mineralogiia skarnovo-barito-
polimetallicheskogo mestorozhdeniia Karagaily (TSentral'nyi
Kazakhstan) Alma-Ata. Vol.1. [Hypogenic mineralization] Gipo-
gennaia mineralizatsiia. 1962. 240 p.   (MIRA 15:5)

1. Akademiya nauk Kazakhskoy SSR (for Bok).
        (Karagayly region (Kazakhstan))—Ore deposits)

YANULOVA, M. K.

Wittichenite and its intergrowth with other minerals. Zap.
Vses. min. ob-va 91 no.3:363-365 '62.   (MIRA 15:10)

(Kazakhstan—Wittichenite)

YAKIMENKO, G., prepodavatel' tekhnicheskikh distsiplin pedinstituta (g. Krivoy
Rog); YANUM, T. [Janums, T.], prepodavatel' (Yaunaglona, Latviyskaya
SSR); KAMANITSYN, A., prepodavatel' avtoshkoly (g.Kostroma)

Discussing the article "From the simple to the complex." Za rul. 20
no.7:30 Jl '62.   (MIRA 15:7)
               (Automobile drivers)

VDOVIN, Yu.A.; YANUS, R.I.

      Automatic control of the magnetic properties of electrical
      sheet iron in the production line. Trudy inst. Kom.stand.mer
      i izm. prib no.64:70-74 '62.   (MIRA 16:5)
        (Sheet iron—Magnetic properties)   (Automatic control)

YANUS, R. I.

New Method of Determining the Magnetic Constants of Small Specimens of
Electrotechnical Steels. ZhETF 3, 1203, 1933.   Techn. Phys. 1, 1, 1934.

State of the cerium atom inside the metallic lattice. I. Yanus and V. I. Drozhzhina. *Compt. rend. acad. sci. (U.R.S.S.)* 7, 411–12(in English 413–14)(1934).— Measurements were made on pure metallic Ce by the Faraday method at temps. varying from −170° to −101°. The dependence of $1/\chi$ on temp. is strictly rectilinear. By extrapolation $\theta = 0°$abs.; the magnetic momentum $= 11.4\ M_0$, remains const. throughout the whole temp. interval. The data of Owen give $\rho \sim 11\ M_0$ and $\theta = 0°$abs. If all the possible states of the ionized Ce atom are considered, the nearest probable values of ρ correspond to Ce^+ either with $\rho_0 = 12.7\ M_0$ (normal state F) or with $\rho_0 = 13.2\ M_0$ (abnormal state H) and Ce^{+++} $\rho_0 = 12.7\ M_0$ (normal state F). Conclusion: The lattice of Ce metal probably consists either of Ce^+ or Ce^{+++} ions with usual values of ρ. Ce^{+++} is assumed to be the most probable state. At temps. below $\theta = 0°$abs. Ce metal may become ferromagnetic.   W. J. Peterson

YANUS, R. I., & SHUR, Ya. S.

A new Method for Determining the Magnetic Susceptibility of Gases and
Vapors, DAN SSSR, ", 465, 1934.

YANUS, R. I., & SHUR, Ya. S,

Magnetic Properties of the Vapors of Benzene. Nature 134, 101, 1934.

CA

PROCESSES AND PROPERTIES INDEX

The character of binding in the carbon monoxide mole-
cule. R. L. Yamm and I. S. Shur. *Physik. Z. Sowjet-
union* 7, 19-25 (1935).—A simple method is described for
measuring the magnetic susceptibilities of gases. An ap-
plication to CO gives a value for the molar susceptibility
of $(-118 \pm 6).10^{-6}$. From the principle of additivity
it is concluded that the C and O are bound by a triple
bond.   Morris Muskat

METALLURGICAL LITERATURE CLASSIFICATION

YANUS, R. I.

The Curve of Magnetization of Iron Monocrystals. ZhETF 5, 292, 1935.
Sow. Phys. 7, 380, 1935.

The magnetic susceptibility of bromine vapor. I. Shur and R. Yao. Physik. Z. Sowjetunion 7, 501-6(1935); cf. C. A. 30, 6036⁶.—The app. described contains no metallic parts, and hence the magnetic susceptibility of chemically active vapors can be detd. The measured sp. susceptibility of Br vapor was $x = -(0.46 \pm 0.04) \times 10^{-6}$. Calcn. of the mol. susceptibility were made by 3 different methods and compared with the exptl. value. No conclusion could be drawn concerning the most reliable method. In general, theory agrees well with expt.
Allen S. Smith

YANUS, R.I.

DROZHZHINA, V, I,, YANUS, R. I.

New Magnetic Alloy of Very High Coercive Power. Nature 135, 36, 1935.

SHUR, YA. S., YANUS, R. I.

Ballistic Appratus for the Testing of Weak Magnetic Materials and the
Method of Using it. Zav. Labor. 5, 621, 1936.

PROCESSES AND PROPERTIES INDEX

State of the rare earth elements in a metal lattice.
V. I. Drozhzhina and R. I. Yanus. *Physik. Z. Sovjet-union* 9, 72-80(1936).—The relation between temp. and magnetic susceptibility of Ce and Pr was studied. For Ce the magnetic moment is $p = 11.4 M_w$ (Weiss magne-tons) and the Curie temp. is $0 = +0°K$. For Pr, $p = 16.0 M_w$ and $0 = +2°K$. A comparison between exptl. and calcd. values for p indicate that the metals in crystal lattices are in the same state as when in trivalent chem. combination.   C. E. P. Jeffreys

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

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Methods of magnetic control of surface decarburization and structure of steel rods. R. Yanus and Ya. Salitra. *Zavodskaya Lab.* 6, 44M-55(1937). A crit. discussion in application to the manuf. of roller-bearing steel rods.

Chas. Blanc

YANUS, R. I.

Works of Magnetic Laboratories. Ural FTI. AN SSSR (Physics Series) No 6.
868, 1937.

GRIGOROV, K. V. ; LUK'IAHOVA, N. L.; IAHIN, N. I.

Magnetic Method of Discovering Internal Defects in Rotating Bodies

Zav. Labor. 6, 1102, 1937

YANUS, R. I.

The Question of Magnetic Susceptibility of Metallic Cerium. ZhETF 7,
1132, 1937. Sow, Phys. 12, 383 1937.

YANUS, R. I.

Standard for Electrotechnical Sheet Steel. Elektricheskvo, 22 , 3, 1937.

PROCESSES AND PROPERTIES INDEX

CA

Magnetic hysteresis in monocrystals. Ya. Shur and R. Venas. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 8, 67-9(1938).—Measurements on the coercive forces in transformer steels along different axes in the (100) plane show that these have fairly const. finite values of 0.1 to 0.3 oersteds as also found by Ruder and Status. In different directions these monocrystals show magnetic anisotropism.

F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

YANUS, R. I.

Some Calculations for Magnetic Defectoscopy. ZhETF 8, 307, 1938.
Techn. Phys. 5, 1, 1938.

YANUS, R. I., SHUBINA, L. A., SOKOLOV, A. D.

Methodology of Magnetic Testing of Whole Sheets of Electrotechnical
Steels. Tests for Losses in an Open Magnetic Chain. ZhETF 8, 1703, 1938.

YANUS, R. I., SHUR, Ya. S.

The Effect of Heat-Treatment in a Magentic Field on the Magnetic Propertites
of Ferromagnetic Monocrystals. DAN SSSR, 20, 1287, 1938.

CA

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PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

Time decrease of the permeability of transformer
steel. R. I. Yanus and V. I. Droshzhina. J. Tech.
Phys. (U. S. S. R.) 9, 1940 70(1939). Magnetic per-
meability of steel (4% of Si) rises after heating to 750°
and slow cooling, especially when the cooling takes place
in a magnetic field. Its slow decrease after cooling is in-
dependent of whether the cooling was carried out in a
magnetic field or otherwise. Presumably the transformer
steel is a mixt. of 2 phases.   I. I. Hakerman

A S M - S L A   METALLURGICAL LITERATURE CLASSIFICATION

YANUS, [R.I.]   *Inductivity apparatus +*
                                                          Materials

ipi On the Magnetic Properties of Steel for
    Radio Apparatus.—Yanus, Shuksa, & Druzhinin.
    (*Izvestiya Elektroprom. Slab. Toka*, No. 8, 1940,
    pp. 40-50.)
    The specific requirements which should be laid down
for steel to be used in the manufacture of transformers
in radio apparatus are discussed, and the necessity is
pointed out for taking account of gapping when there
is a relatively strong polarising current   A ballistic
circuit (Fig. 2) for testing samples is described, and
methods are discussed for the correct estimation of per-
meability from the experimental results   It is also
suggested that instead of demagnetising the samples
before testing, they should be magnetised immediately

before each test in a field of a definite intensity.   Finally,
the errors introduced by various types of joints in the
magnetic circuit are estimated

YANUS, R. I.; KHALILEYEV, P.A.; SHUBINA, L.A.

Diagram for new Hyper-Sensitive Plant Control of Rod and Sheet Materials by Magnetic Permeability

ZhTF 11, 936, 1941

YANUS, R. I.

Magnetic Defectoscopy. (Monograph) Gostekhizdat, 1946.

YANUS, R. I.; CHABAN, A. S.

Attempt to Analyze the Work of Drum Type Magnetic Suparators

ZhTF 7, 1854, 1947

IAMUS, R. I.   PA 57777

USSR/Phys   Nov/Dec 1947
     Ferromagnetism
     Energy - Dissipation

"Heterogeneity of Ferromagnetics as Source of Addi-
tional Losses of Energy During Magnetic Reversal," R.
I. Yanus, V. V. Druzhinin, Inst Phys of Metals, Ural
Br, Acad Sci USSR, 1 p

"Izv Akad Nauk SSSR, Ser Fiz" Vol XI, No 6

Evaluation of the possible order of magnitude of each
of the sources of additional losses considered indi-
cates that their sum can show magnitude of this order
as well as the normal difference between theoretical
and experimental values.

                                            57777

YANUS, R. I.

FA 57176

USSR/Phys
Magnetite
Magnetic Permeability

Nov/Dec 1947

"Accommodation of the Magnetic Permeability of
Magnetite," R. I. Yanus, Ya. S. Shur, V. V. Druzhin-
in, A. M. V'yukhina, Ural State U imeni A. M.
Gor'kiy, 1½ pp

"Izv Akad Nauk SSSR, Ser Fiz" Vol XI, No 6

It was established experimentally that some varieties
of magnetites when broken down into fine powder ex-
hibit in very sharp form capacity for accommodation
and disaccommodation of magnetic permeability. If
the magnetite is subjected to magnetic reversal.

USSR/Phys (Contd)

Nov/Dec 1947

several times after lying for some time outside
accommodating influences, the permeability increases
noticeably. If it is then kept outside an accommo-
dating influence, however, it again gradually re-
turns to former condition.

57176

57176

YANUS, R. I., Prof

USSR/Physics
        X-ray Inspection
        Metallurgy

                                                            1947

"Electromagnetic Methods of Defectoscopy in Service
to Soviet Technology," Prof R. I. Yanus, 7 pp

"Zavodskaya Laboratoriya" Vol XIII, No 11

The system of checking the physical defects of parts
has been going on for a long time. At the present
time with mass production and the necessity for high
quality materials it is necessary to use a more effi-
cient method. One of these is an electromagnetic
method. Discusses control of the microstructure and
chemical composition, control over the disintegration

USSR/Physics (Contd)   Nov 1947

of the compactness of the material, control over the
thickness of the layer being applied as plate, con-
trol over the dimensions of the parts.

LC   36T100

LC   36T100

YANUS, R. I.

USSR/Magnetite   Feb 47
    Magnetic permeability

"The Accommodation of the Magnetic Permeability of Magnetite," A. M. Vyuchina, V. V.
Druzhinin, J. S. Shur, R. I. Yanus, 14 pp

"Zhur Tekh Fiz" Vol XVII, No 2

Tables and graphs showing the relation between H and B for various temperatures, values
of B_{max} and Δ B as functions of time, etc., for various compositions of magnetite.

PA 11T27

YANUS, R. I.

USSR/Magnetism   Feb 47
     Currents, Electric - Alternating

"The Induction of Residual Magnetism by an Altering Current," A. V. Al'tma, R. I.
Yanus, 10 pp

"Zhur Tekh Fiz" Vol XVII, No 2

Connections diagrams of apparatus for inducing residual magnetism by alternating current.
Hysteresis diagrams and equations representing subject action.

PA 11T26

YANUS, R. I.

USSR/Magnetization   Feb 47
    Metallography

"Study of the Work of a Magnetizing Devices of an AC Remanence-defectoscope," A. V. Al'tma, R. I. Yanus, 8 pp

"Zhur Tekh Fiz" Vol XVII, No 2

Connection diagram of apparatus for detecting defects in steel. Characteristic curves describing its operation.

PA 11T25

Investigation of the Action of the "Remanence Deflec-
toscope" in an Alternating Current. (In Russian.) A.
V. Altma and R. I. Ianus. *Journal of Technical
Physics* (U.S.S.R.), v. 17, no. 2, 1947, p. 153-160.
Gives results of an experimental investigation of
the effects of different factors on the Magnaflux
method of inspection for defects in metals.

YANUS, R. I.

Magnetic Instruments

Suitability of magneto-mechanical selectors of
defectoscope stations for railroad rails.
Trudy Inst. fiz. met No. 7, 1948

YANUS, R. I.

Magnetic Testing

Classification and terminology of magentic
defectoscopy, Trudy Inst. fiz. met. No. 7, 1948.

Monthly List of Russian Accessions, Library of Congress November 1952 UNCLASSIFIED

YANUS, R. I.

Magnetic Testing

Some problems of the theory of magnetic
defectoscopy, Trudy Inst. fix met, No. 7
1948

Monthly List of Russian Accessions, Library of Congress, November 1952 UNCLASSIFIED

YANUS, R. I.

Apr 1948

USSR/Physics
    Magnetization
    Permalloy

"Observations on an Article by N. G. Ardashev, Ye. P. Svirina, and A. Ye. Bryukhanov, 'The Magnetization of Permalloy in a Constant Longitudinal Magnetic Field'," Ya. S. Shur, R. I. Yanus, Inst of Phys of Metals, Ural Br, Acad Sci USSR, Sverdlovsk, 14 pp

"Zhur Tekh Fiz" Vol XVIII, No 4

Briefs the discrepanices and deficinecies of subject article.

Submitted 30 Apr 1947

PA 64T92

Influence of Austenite on the Magnetization Curve of Steel. (In Russian.) V. V. Parfenov and R. I. Yanus. Zhurnal Tekhnicheskoi Fiziki (Journal of Technical Physics), v. 18, Feb. 1948, p. 161-166.

Gives tables and curves for magnetization of tempered Cr-Mn steel with austenite content up to 74% in fields of 20 12000 oersteds. Shows that proportionality between magnetization and final concentration of the ferromagnetic phase exists to a great extent for fields of medium magnetic resistance as well as for high-resistance fields.

YANUS, R. I.

36171 Elektromagnitnyye metody defektoskopii v rabotaKh ural'skikh fizikov. Trudy
In-ta fiziki metallov, vyp. 12, 1949, S. 150-56.--Bibliogr: 41 nazv.

SO: Letopis' Zhrunal'nykh Statey, No. 49, 1949

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538.221

1926. Anistrophy of the magnetic permeability of monocrystals of iron silicide in the range of weak magnetic fields. A. L. Goldman, V. V. Druzhinin and R. I. Yanus. J. Tech. Phys., USSR, 20, 571-8 (May, 1950) In Russian.

It is shown experimentally that in the range of weak magnetic fields the minimum permeability of monocrystalline disks of an alloy Fe + 3% Si is obtained by magnetization along the diagonal axis of the cubic lattice, the maximum permeability along the tetragonal axis. An anisotropy conforming to N. S. Akulov's well-known law of anisotropy is observed only for magnetizations far exceeding the range of the maximum permeability. This invalidates the statements of Williams and others on the uniform character of the law of anisotropy of the permeability of monocrstals in strong and weak fields.

B. F. Kraus

538.082.742 : 621.317.715 : 621.317.42

2817. **Measurement of small differences of magnetic fluxes by a ballistic galvanometer.** V. L. DROZZHINA, L. F. SHAINUNA, AND R. I. YANUS. *J. Tech. Phys., USSR, 20, 698–706 (June, 1950) In Russian.*

The behaviour of a ballistic galvanometer under the action of 2 successive impulses of nearly equal intensity, but of opposite sign, is investigated. The conditions are established under which the ballistic throw due to such impulses furnishes a sufficiently accurate measure of these impulses. The usefulness of the method is shown in measurements of hysteresis losses in soft ferromagnetic specimens in an open magnetic circuit. The comparison of the "impulse difference method" with the usual ballistic method shows the greater convenience of the former, because every B requires one reading only compared with the two of the latter. A mechanism for taking the corresponding periods τ may also be of a very simple

kind. The relative error (δw_k) should be of the same order as that of the conventional method. However, whilst for the latter this represents the optimum attainable, the present method is susceptible of further improvements in this respect (reduction of τ/T, increase of R or reduction of L of the galv. circuit, or else using the galv. in fluxmeter conditions).

D. F. KRAUS

YANUS, R. I.

USSR/Electricity - Measurements,   Jul 51
                  Magnetic

"'The Tare Method' in Magnetic Tests of Dynamo and
Transformer Steel in Differential Units," Prof
R. I. Yanus; O. V. Grekhov, V. V. Druzhinin, Engi-
neers, Verkh-Isetskiy Metallurgical Plant

"Elektrichestvo" No 7, p 76

Suggests a method similar to the well-known "tare
method" used in accurate weighings. The method
substantially increases the accuracy of std mag-
netic tests without any addnl labor, expense, or
complications of the testing methods. Submitted
24 Jan 51.

199T27

YANUS, R. I., PARFENOV, V. V.

Electromagnetism

Practicability of electromagnets for measuring the reverse sensivity of ferromagnetic
material in interne fields. Izv. AN SSSR. Ser. fiz. 16 No. 5, 1952.

9. **Monthly** **List** **of** **Russian** **Accessions,** Library of Congress, _____June_____1953. Unclassified.

IANUS, R. I.

PA 251T30

USSR/Physics - Magnetic Hysteresis   Nov/Dec 52

"Effect of Plastic Deformation on Oscillational and Rotational Magnetic Hysteresis in Dynamo Iron," V. I. Drozhzhina, R. I. Yanus, and V. A. Vershinina, Inst of Phys of Metals, Ural Affiliate, Acad Sci USSR

Iz Ak Nauk SSSR, Ser Fiz, Vol 16, No 6, pp 695-702

Limited exptl material processed leads to tentative conclusions that cold working and mechanical deformation possess deteriorating effect on rotational and oscillational hystereses, which values strongly depend also on structural states of samples.

251T30

PA 251T29

USSR/Physics - Magnetization,   Nov/Dec 52
          Hysteresis

"Variations of Magnetic Hysteresis Loops During
Variations of Maximum Magnetization," V. I.
Drozhzhina, R. I. Yanus, V. P. Kartashov, and E. V.
Kaplun, Inst of Phys of Metals, Ural Affiliate,
Acad Sci USSR

Iz Ak Nauk SSSR, Ser Fiz, Vol 16, No 6, pp 703-712

Analysis of behavior of microstructure of magnetism
related to magnitude and direction of magnetic field.
Expts show greatest magnetic hysteresis to correspond

251T29

to remagnetization processes below saturation point.
Problem was also analyzed by N. S. Akulov (Ferro-
magnetizm, 1939).

251T29

USSR/Physics - Coercive Force, Magnetism   May 52

"Anisotropy of the Coercive Force in Monocrystals of Ferrosilicic Alloy," V. V. Druzhinin, R. I. Yanus, Sverdlovsk

"Zhur Tekh Fiz" Vol XXII, No 5, pp 848-857

Anisotropy of coercive force in monocryst disks of ferrous alloys with 3% silicon, obtained from a cut of sheets of big crystallites of transformation steel of trademark KhVP, in which the plane of the dodecahedron of the cryst lattice is nearly parallel to the plane of disks, was studied experimentally. It was shown that the coercive force is proportional to the digonal axis of crystal, and not to the trigonal as previously stated by Williams (cf. Phys Rev, 52, 1937).

Received 7 Feb 52.

222T88

222T88

YANUS, R. I.

(EER 56 no. 670. 1014. '53)

YANUS, R. I.

USSR/Physics - Piezoelectrics   Aug 52

"Problem of the Characteristics of Dielectric Prop-
erties of Piezoelectrics," R. I. Yanus, Inst of Phys
of Metals, Acad Sci Ural SSR

"Zhur Tekh Fiz" Vol 22, No 8, pp 1256-1261

Criticizes soln of subject problem by Kazarnovskiy
(Zhur Tekh Fiz" 21, 808, 1951) who did not suffi-
ciently distinguish between piezoelec and "usual"
dielectrics. Suggests some improvements in the men-
tioned soln. Received 8 Apr 52.

226788

1. YANUS, R.I., PROF, SHTENGEL'MEYER,S.V.

2. USSR (600)

4. Magnetometer

7. Device for checking demagnetization of steel products(magnetoscope). Vest.mash, 32
    no. 7, 1952

9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

Yanus, R. I.

3

TRUDY INSTITUTA FIZIKI METALLOV, AKAD. NAUK. URALSKII FILIAL   1954, NO, 15

On the theory of inductive pick-up elements with saturated ferromagnetic cores for coercivity meters by R. I. Yanus (p. 76-89) - The theory of coercivity measure-ments with a frame-type apparatus with ferromagnetic core is presented. (See also Fiz. Met. Metallovedenie, 1950, 1, No. 1, pp. 118-123, and Zav. Lab., 1955, 21, No. 10, pp. 1193-7).

IAHUS, R.I.

On the variations of magnetic properties within a single batch of
iron sheets used in electrical engineering. Fiz.met.i metalloved.
1 no,1:84-91 '55.   (MLRA 9:3)

1. Institut fiziki metallov Ural'skogo filiala Akademii nauk SSSR.
                (Sheet iron--Magnetic properties)

YANUS, R.I.

On the measurement of commutational magnetization curves in direct
and alternating fields. Fiz.met.i metalloved. 1 no.1:101-104 '55.
(MLRA 9:3)

1. Institut fiziki metallov Ural'skogo filiala Akademii nauk SSSR.
(Sheet iron--Magnetic properties)

FIZ. MET. I METALL. VOL. 1, NO. 1, 1955

Apparatus for the determination of electromagnetic characteristics of dynamo and transformer iron on whole sheets by A. D. Sokolov and K. I. Yanus (p. 110-117) - An apparatus is described which can be used for non-destructive tests on large sheets. It consists of two parts: one for the determination of d.c. magnetisation curves using the induction method and the other for the determination of specific losses by the wattmeter method and for the determination of alternating magnetisation curves.

YANUS, R.I.; FRIDMAN, L.A.; DROZHZHINA, V.I.

On the sensitivity of ferromagnetic core coercimeters. Fiz.met.i
metalloved. 1 no.1:118-123 '55.   (MLRA 9:3)

1. Institut fiziki metallov Ural'skogo filiala Akademii nauk SSSR.
                (Magnetic measurements)

USSR/Magnetism - Ferromagnetism, F-4

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34913

Author: Yanus, R. I., Kadkin, V. A.

Institution: Ural State University, Sverdlovsk, USSR

Title: On the Structure of the Family of Symmetrical Hysteresis Loops of
Ferromagnetics

Original
Periodical: Fiz. metallov i metallovedeniye, 1955, 1, No 3, 420-423

Abstract: A study is made of the effect of cold working on the structure of the
family of symmetrical hysteresis loops in transformer steel (4% Si).
The magnetization is made uniform over the cross section by using
specimens of parabolic shape, and the uniformity of cold working is
obtained uniformly bending the specimens on surfaces of definite
curvature. The hysteresis loops were plotted using the reversal
method in a ballistic installation, while the coercive force was
measured both by the throw method, as well as by reversal. It was
observed that homogeneous cold working of the transformer steel does

Card 1/2

USSR/Magnetism - Ferromagnetism, F-4

Abst-Journal: Referat Zhur - Fizika, No 12, 1956, 34913

Abstract: Not effect the properties of symmetric magnetic hysteresis loops, present in the non-cold-worked iron.

Card 2/2

YANUS, R.I.

Category : USSR/Magnetism - Ferromagnetism   F-4

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 1408

Author   : Yanus, R.I., Voroshilov, V.P.
Inst   : Ural University, Sverdlovsk, USSR
Title   : On the Structure of the Family of Symmetrical Hysteresis Loops of
           Ferromagnetics. III. Investigation of Technical Nickel.

Orig Pub : Fiz. metallov i metallovedeniye, 1955, No 3, 424, 426

Abstract : Symmetrical hysteresis loops of technical Ni were measured at various
           maximum intensities of magnetization of the cycle. All the loops in which
           the maximum magnetization is approximately 50% higher than the saturation
           magnetization, have been found to have approximately the same width: these
           loops differ only in the initial portions of the ascending and descending
           branches, while the center and final sections are equal, with an accruacy to
           within the measurement error. The higher the maximum magnetization of the
           cycle, the longer the equal sections of the corresponding branches of the loops.
           Since a similar character of the structure of the family of symmetric hyster-
           esis loops was obtained earlier for iron, it is quite probable that it is com-
           mon to a very wide class of ferromagnetics.

Card   : 1/1

YANUS,R.I.

Theory of induction receiving elements with ferrosaturated cores
used in coercive force meters. Trudy Inst. fiz. met. no.15:76-89
'55.
                                                    (MLRA 8:6)
            (Magnetic measurements)

YANUS, R. I., and KARTASHOV, V.P. (Sverdlovsk)

"Some structure characteristics of the family of the symmetrical hysteresis loups of the ferromagnetic substances," a paper submitted at the Internatonal Conferenceon Physics of Magnetic Pheonmens, Sverdlovsk, 23-31 May 56.

YANUS, R.I.

Category : USSR/Magnetism - Experimental Methods of Magnetism   F-2

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4017

Author   : Yanus, R.I., Fridman, L.A., Drozhzhina, V.I.
Inst   : Institute of Metal Physics, Ural Branch, Academy of Sciences, USSR
Title   : Rapid Method for the Monitoring the Coercive Force of Electrotechnical
           Iron Sheet Metal.

Orig Pub : Zavod. laboratoriya, 1956, 21, No 10, 1193-1197

Abstract : A new instrument is described, a coercitimeter, which makes it pos-
           sible to measure H_c of electrotechnical iron sheets. The measurement
           is carried out in a closed magnetic loop, consisting of the tested
           sheet, located in a solenoid and pressed tightly against the faces of
           two halves of a yoke, as well as of a ferro-transducer (ferro-probe),
           which closes the outer portion of the magnetic circuit. The process
           of measuring H_c consists of the following. The tested sheet is magne-
           tized and the demagnetizing current is turned on. The demagnetizing
           current is x increased until the pointer of the balance indicator re-
           turns to zero; the current in the solenoid is then a measure of the

Card   : 1/2

Category : USSR/Magnetism - Experimental Methods of Magnetism

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4017

F-2

value of H_c of the measured tested sheet. It was established ex-
perimentally that there is sufficiently good correspondence between
H_c and the electro-magnetic losses in the case of electrotechnical
iron without grain orientation. This permits the use of the described
coercitimeter for an indirect estimate of the value of the electro-
magnetic losses, and consequently, also for the control of the quality
of hot-rolled dynamo and transformer iron.

Card   : 2/2

AUTHOR: Yanus, R. I.

126-2-25/30

TITLE: On the limit of usefulness of multiple repeated measure-
ments. (O predele poleznosti mnogokratnykh povtornykh
izmereniy).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals
and Metallurgy), Vol.IV, No.2, 1957, pp.369 - 374 (USSR).

ABSTRACT: Kogoberidze, D.B. and Kirillov, V.V. (1) criticise one of
the assumptions of the statistical theory of errors, namely
the assumption that with an increasing number of measure-
ments n of a single value N by the same instrument the
deviation of the mean arithmetic value of the measured
results from the real value tends to become zero for any
sensitivity of the instrument, showing that no improvement
in accuracy will be obtained if the measurements are re-
peated more than a certain number of times. These conclu-
sions are criticised and the author of this paper concludes
that an increase in the number of repetitive measurements
for the purpose of increasing the accuracy and reliability
of the obtained results is useful for any number of repe-
titive measurements if the results of the individual mea-
surements scatter within such limits that the "directional"
effect of the real value of the measured magnitude on the

Card 1/2

On the limit of usefulness of multiple repeated measure-
ments. (Cont.)
126-2-25/30
measured results differs from zero.

There are 3 Slavic references.

SUBMITTED: October 8, 1956.

ASSOCIATION: Institute of Metal Physics, Ural Branch, Ac.Sc. USSR.
(Institut Fiziki Metallov Ural'skogo Filiala AN SSSR).

AVAILABLE:

Card 2/2

YANUS, R.I.

AUTHORS: Yanus, R. I., and Kartashov, V. P.   48-9-11/26

TITLE: Note on the Shape of Families of Symmetric Hysteresis Loops of Ferromagnetica (O strukture semeystva simmetrichnykh petel' i gisterezisa ferromagnetikov).

ABSTRACT: In this investigation an uncomplicated, although not quite perfect method was employed. Samples were prepared from a polycrystalline material possessing texture (from cold rolled dynamo sheets alloyed with 3 % silicium). They were shaped into the form of arrows with sharpened tips, having the same thickness all over and cut at the sides in the shape of parabolas. The magnetic measurements were conducted according to the ballistic method. From the curves, which have been obtained, it can be seen, that J_{ma} coincides approximately with the magnetization where the differential permeability of the material according to the commutation curve ($\mu_{dk} = 4 \pi dJ_m/dH_m$) reaches its maximum. It is shown, that in the range of very high magnetization, where according to the orthodox theory of magnetization processes a

Card 1/2

Note on the Shape of Families of Symmetric Hysteresis Loops   48-9-11/26.
of Ferromagnetica.

magnetic reversal could only take place by reversible processes, a
considerable hysteresis appears. It is assumed, that the hysteresis
is connected with the hysteresis of the formation and of the disap=
pearance of some types of "sub domains" in the range of high magne=
tization, which explanation is favoured by the investigations con=
ducted by various authors of the powder patterns of Akulov-Bitter.
J_m denotes maximum magnetization, J_{ma} an certain value of J_m;
$G\mu_{dk}$ differential permeability in the section k and H_m the maximum
field strength.
There are 5 figures and 8 references, 5 of which are Slavic.

ASSOCIATION: Chair for General Physics of the Ural State University (Kafedra
obshchey fiziki Ural'skogo gos. universiteta).

AVAILABLE: Library of Congress.

Card 2/2

AUTHORS: Yanus, R. I., Candidate of Physical-Mathcmatical 1o5-58-6-2o/33
Sciences, Fridman, L. A., Candidate of Physical-Mathematical
Sciences (Sverdlovsk)

TITLE: On Cases of an Incorrect Use of the Commutation-Magnetization-
Curve in Approximate Calculations of Circuits With Ferro-
magnetics(O sluchayakh nepravil'nogo primeneniya kommutatsion-
noy krivoy magnitnosti pri priblizhennykh raschetakh tsepey
s ferromagnetikami)

PERIODICAL: Elektrichestvo, 1958, Nr 6, pp. 77-8o (USSR)

ABSTRACT: The term "commutation-magnetization-curve" (kommutatsionnaya
krivaya magnitnosti") is deliberately used here instead of
the term "fundamental magnetization-ourve" ("osnovnaya krivaya
namagnichivaniya") recommended in Elektrichestvo, 1957,
Nr 6, p. 17 under position 92. It is pointed out that the
opinion on the alleged usability of the $B_m(H_m)$-curve not only
for the reading of the H_m-values according to known B_m and in-
versely, but also as a good (if not the best) approximation
without hysteresis for the B(H)- loop not only within the do-
main of high but also of low induction is very widely spread.
It is pointed out that the differential equations to be solved
Card 1/3   in the computation of amperage and voltage in electric circuits

On Cases of an Incorrect Use of the Commutation-Magnetization-   105-58-6-20/33
-Curve in Approximate Calculations of Circuits With Ferromagnetics

with ferromagnetics contain the function $\mu_d(H)$ or $\mu_d(B)$ as the main characteristic of ferromagnetics. $\mu_d = dB/dH$ denotes the magnetic differential permeability. Therefore only an approximation of the B(H)-curve can be used for such computations which qualitatively correctly expresses the functions $\mu_d(H)$ and $\mu_d(B)$. From this point of view the approximation formula (1) given in a textbook (Ref 1) is investigated here. It is shown that the use of this formula leads to qualitative deviations. It is further shown that in contrast to the curves of magnetization, demagnetization and magnetic reversal the $B_m(H_m)$-curve does not express such processes (neither "fundamental" ones nor others). It is only the geometrical position of the peaks of magnetic-reversal-curves and any two points of the curve, infinitely near to each other themselves, belong to separate magnetic states (which are separated by entire cycles of magnetic reversal taking the course of entirely different curves). It is therefore quantitatively and qualitatively different from these curves. The denotation used at present conceals this important peculiarity of the $B_m(H_m)$-curve. Therefore it would be better to call this curve a commutation-

Card 2/3

On Cases of an Incorrect Use of the Commutation-Magnetization-   1о5-58-6-2о/33
-Curve in Approximate Calculations of Circuits With Ferromagnetics

or amplitude-magnetization-curve, for it only expresses a certain aspect of the magnetic properties, the magnetizability of the material. Therefore it is inexpedient to call it a "fundamental" curve.

B_m denotes the maximum induction, H_m the maximum field strength.

There are 1 figure and 7 references, 7 of which are Soviet.

SUBMITTED: October 15, 1957

1. Electric circuits--Mathematical analysis   2. Ferromagnetic materials--Electrical factors

Card 3/3

AUTHOR: Yanus, R. I.   SOV/126-6-2-34/34

TITLE: "Electrical Iron" or "Steel" ("Elektrotekhnicheskoye
        zhelezo" ili "stal'").

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2,
        pp 382-384 (USSR)

ABSTRACT: The author discusses terminology and in conclusion
        recommends using the terms as follows:
        "alloyed iron" is an alloy of iron with alloying
        components, the structure of which is predominantly ferrite,
        whilst the other components (cementite and other carbides,
        austenite, martensite) are not necessary or desirable;
        "Steel" is an iron alloy containing up to 2% C, in the
        structure of which non-ferritic components (austenite,
        martensite, cementite and other carbides) are necessary
        for obtaining the desired properties.
        There are 9 references, all of which are Soviet.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR
        (Institute of Metal Physics, Ural Branch, Ac.Sc., USSR)

SUBMITTED: December 4, 1956

Card 1/1   1. Iron--Properties   2. Steel--Properties   3. Alloys--Properties
    USCOMM-DC-55879

VANUS, P. I.

Control method of the magnetic properties of electrical sheet iron.
Trudy Inst.fiz.met. UFAN SSSR no.20:141-151 '58.   (MIRA 12:11)
     (Sheet iron--Magnetic properties) (Magnetic measurements)

AUTHOR: Druzhinin, V.V., Cand. of Phys.Math.Sci., Zubov, Yu.Ye.,
            Engineer, Kozhurov, A.A., Engineer and Professor Yanus,
            R.I.

TITLE: An apparatus for measuring the specific losses and
            magnetic induction of whole sheets of electrical steel
            (Apparat dlya izmereniya udel'nykh poter' i magnitnoy
            induktsii elektrotekhnicheskoy stali na tselykh listakh)

ABSTRACT: At present the principal method of determining specific
            losses and magnetic induction in electrical sheet steel
            is by the Epstein apparatus, which suffers from a number
            of disadvantages. The losses of the steel may be
            increased by work-hardening when the strips are cut or
            reduced by stress relief. The method is rather unreal
            because the strips are much narrower than those used in
            practice and finally the tests waste a good deal of
            material. Therefore, in recent years attempts have been
            made in the USSR and abroad to develop accurate and quick
            methods of testing whole sheets of steel. It is a

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SOV/110-58-7-7/21

An apparatus for measuring the specific losses and magnetic induction of whole sheets of electrical steel

SOV/110-58-7-7/21

requirement of standard GOST-802-54 that one sheet shall be taken from each ton of steel but not less than 4 sheets per batch. It is, therefore, more convenient to test sheets four at a time rather than singly, and equipment has been designed accordingly. If there are more than four sheets to be tested the quality of the steel is evaluated with a coercivity meter. The coercive force is determined on all the test sheets since it is proportional to the hysteresis loss. For final evaluation of the quality of the steel, four sheets are taken, two of which have the minimum and two the maximum coercive force as specified in standard GOST-802-54 for the Epstein apparatus. The construction of the apparatus is then described. It is intended for sheets of 1200 x 750 mm. The length of 1200 is what remains from the

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An apparatus for measuring the specific losses and magnetic induction of whole sheets of electrical steel .

SOV/110-58-7-7/21

standard sheet after two pieces have been cut off for the standard mechanical tests. The sheets are mounted in two solenoids, arranged one above the other as shown in Fig 1. The solenoids are 40 mm shorter than the sheets. At the ends of the solenoids there are armatures which form a closed magnetic circuit with the sheets. To ensure good magnetic contact, each armature consists of twelve sections pressed on by springs. A general view of the apparatus is shown in Fig 2. As butt joints are used there is no need to press the sheets flat. Each solenoid has 600 measuring and magnetising turns uniformly distributed over the length. The specific losses are measured by an absolute watt-meter method using a special low-power-factor wattmeter. The formula used for calculating the losses is explained and the significance of the various connections is considered. The estimated errors of the method are discussed in some detail. The distribution of magnetic induction along a sheet is plotted in Fig 3 and the influence of insulation between

Card 3/5

An apparatus for measuring the specific losses and magnetic induction of whole
sheets of electrical steel

sheets on the specific losses in steel are given in
Table 1. It is considered that the accuracy of the
determination of losses in the apparatus is about the
same as in the Epstein apparatus. Comparative tests were
made between the Epstein apparatus and the new one, with
the results given in Table 2. Values are sometimes
somewhat lower with the Epstein apparatus, apparently
because of the relief of stresses in the steel on cutting.
The way in which the equipment is used at the steelworks
is described. The extent of the differences between the
losses determined in the old and new apparatus on 450
samples is given in Fig 3. On 95% of the samples
agreement was within 3% at 10 kilogauss. The agreement
rd 4/5 was not quite so good at 15 kilogauss. Certain

An apparatus for measuring the specific losses and magnetic induction of whole sheets of electrical steel

SOV/110-58-7-7/21

difficulties may be met in testing hot-rolled steel because the anisotropy of the magnetic properties varies. This is not so important with cold-rolled steel because the magnetic properties are guaranteed only in the direction of rolling. The complete testing time is 5 - 7 minutes. On the basis of six months' experience the method is recommended for general use. There are 3 Card 5/5 tables and 3 figures.

SUBMITTED: January 18, 1958.

1. Steel--Testing equipment   2. Electrical equipment--Design
3. Solenoids--Applications

PHASE I BOOK EXPLOITATION

SOV/3547
SOV/26-M-20

Akademiya nauk SSSR. Ural'skiy filial. Institut fiziki metallov

Trudy, vyp. 20 (Transactions of the Institute of the Physics of Metals, Ural Branch, Academy of Sciences USSR, No. 20) Sverdlovsk, 1958. 402 p. Errata slip inserted. 1,000 copies printed.

Resp. Ed.: S.V. Vonsovskiy, Corresponding Member, Academy of Sciences USSR, and V.I. Arkharov, Doctor of Technical Sciences.

PURPOSE: This book is intended for scientists working in the field of physical metallurgy.

COVERAGE: This is a collection of 28 articles written by members of the Institute of the Physics of Metals, Ural Branch of the Academy of Sciences USSR, on problems investigated at the Institute. Studies at the Institute have concentrated on two basic problems: 1) developing a theory of metals and alloys and finding ways to improve the properties of engineering materials; and 2) developing new physical methods for investigating and controlling the quality of materials and metal articles. In connection with these basic problems the articles in the collection treat the following subjects: problems of the multielectron quantum-mechanical theory of solids; the laws of distribution and diffusion of admixtures in various metallic alloys (internal adsorption theory); strength and plasticity of polycrystalline materials in relation to interatomic binding forces, distortions in the crystal lattice; structural reactions in solid phases; theory of diffusion due to chemical reactions in solid phases; theory of the magnetic structure of ferromagnetic substances; theory of the heat treatment of steel; and the physical theory of magnetic measurements (magnetic flaw detection and structural analysis). The first article gives a description of the work being done by the Institute and a list of departments and laboratories along with their chief personnel. Several persons are cited for their work at the Institute. References accompany each article.

YANUS, R. I. Doc Phys-Math Sci -- (diss) "Certain problems of the theory
and technique of magnetic dimensions." ████████████ Sverdlovsk, 1959.

23 pp (Ural Affiliate, Acad Sci USSR), 150 copies. Bibliography: pp 20-23

(68 titles) (KL, 48-59, 112)

-1-

27627
S/194/61/000/002/002/039
D216/D302

1.8000

AUTHORS: Yanus, R.I. and Senkevich, T.M.

TITLE: A simple electromagnetic thickness gauge

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
                no. 2, 1961, 21, abstract 2 A147 (Tr. in-ta fiz.
                metallov. AN SSSR no. 21, 1959, 131-137)

TEXT: A description is given of an instrument for controlling the
thickness of non-magnetic coatings of steel products, based on the
measurement of attraction force exerted on the core of an electro-
magnet. The product is placed on the excited electromagnet. Under
the action of magnetic flux the core of the electromagnet lifts
until it touches the surface coating. By decreasing the magnetizing
current, the instant at which the core loses contact with the pro-
duct is noted, together with the corresponding reading of a milli-
ammeter. The thickness of coating is determined from the above data
and from the calibration curve of the ammeter. Constructional de-

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A simple electromagnetic thickness...

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S/194/61/000/002/002/039
D216/D302

tails of the instrument are given together with the results of experiments, from which certain recommendations as to choice of the instrument parameters depending on its use are made. 6 figures, 2 references.

Card 2/2

8(2)   SOV/32-25-4-42/71

AUTHORS: Yanus, R. I., Kubarev, V. V., Vdovin, Yu. A., Kolpakov, I. P.

TITLE: Automatic Apparatus for Sorting-out Plates of Electrotechnical
                Steel (Avtomaticheskiy apparat dlya rassortirovki listov elektro-
                tekhnicheskoy stali)

ABSTRACT: The comrades G. G. Lyustiberg, P. I. Suruda, and G. G. Anoshen-
                kov also took part in this investigation. An automatic device
                (Fig 1) for sorting out electrotechnical steel plates
                (1500 × 750 mm) was developed on the basis of an improved scheme
                of the coercimeter according to R. I. Yanus et al (Ref 2). The
                plate to be controlled closes a magnetic circuit, is magnetized
                by a selenoid, and closes a circuit of a certain intensity in
                the demagnetizing winding. If the field in the latter is equal
                to the coercive force of the plate, this plate is demagnetized,
                but if the field is stronger or weaker, the plate remains
                magnetized or is overmagnetized in the opposite direction. The
                amount and the sign of the residual magnetization of the plate
                is determined by means of two MKV-2 rectifiers. A scheme of the
                whole device for steel-plate sorting (Fig 2) with a description

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SOV/32-25-4-42/71

Automatic Apparatus for Sorting-out Plates of Electrotechnical Steel

of the operation is given. The efficiency of a model on the scale of 1:3 is indicated with 420 plates an hour. In the Verkh-Isetskiy metallurgicheskiy zavod (Verkh-Isets iy Metallurgical Works), an industrial plant for plate sorting of this .... is designed for three types of steel with a capacity of 80 tons a day. There are 2 figures and 2 Soviet references.

ASSOCIATION: Ural'skiy institut chernykh metallov i Institut fiziki metallov Ural'skogo filiala Akademii nauk SSSR (Ural Institute c Ferrous Metals, and Institute of Metal Physics of the Ural Branch u. ... Academy of Sciences USSR)

Card 2/2

YANUS, R.I.

3.9100

87895

S/126'/60/010/003/004/009/XX
E192/E382

AUTHORS: Drozhzhina, V.I., Zatsepin, N.N., Ponomarev, Yu.F., Fridman, L.A., Shturkin, D.A. and Yanus, R.I.

TITLE: Theory of Ferroprobes with Longitudinal Symmetrical Saturation Excitation

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 3, pp. 359 - 366

TEXT: Aschenbrenner and Goubau (Ref. 1) described in 1936 a new highly sensitive method of measuring the potential of the magnetic field by means of nonlinear magnetic elements, ferroprobes, and they used these for measuring the fluctuations of the magnetic field of the Earth. The theory of such probes was developed more thoroughly in subsequent work of German and Soviet authors (Refs. 2-11) including the authors of this paper, for the case of a uniform DC field. Mikhaylovskiy and Spektor (Ref. 12) dealt with the operation of these probes in a nonuniform field. Considerable progress has been made in the techniques of applying them and as a result of this, highly sensitive magnetometers with very fast response are

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S/126/60/010/003/004/009/XX
E192/E382

Theory of Ferroprobes with Longitudinal Symmetrical Saturation Excitation

available, for instance - for investigating the short-period variations of the magnetic field of the Earth, for searching for mineral deposits by means of aeromagnetic prospecting methods, etc. Furthermore, small-size instruments for measuring local values and gradients of highly nonuniform fields (magnetic flaw detectors for detecting invisible cracks in ferromagnetics), an automatic apparatus for various magnetic measurements, etc. have also been built. In spite of that, a large portion of the practically important problems has to be solved by means of inefficient purely empirical approach, since the theory of these probes is either insufficiently accurate or insufficiently general. In this paper the following problems are formulated and partly solved: 1) taking into consideration more accurately the field of magnetic charges of the core and the eddy-current field in it; 2) taking into consideration more accurately the possible nonuniformity of the

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S/126/60/010/003/004/009/XX
E192/E382

Theory of Ferroprobes with Longitudinal Symmetrical Saturation Excitation

where K_n is a coefficient independent of x; $c(t)$ will be of the same form and the scales of measurement will be determined by K_n. In those cases when not only the scale but also the form of $c(t)$ is varying, the quantitative comparison of various $H_n(x)$ can be determined from $c(t)$ only under certain limiting conditions. There are 2 figures and 17 references: 1) Soviet and 4 non-Soviet.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals of the AS, USSR)

Card 11/12

YANUS, R.I.; VDOVIN, Yu./.

Methods and equipment for nondamaging testing of electrical steel.
Izm.tekh. no.12:37-40 D '61.   (MIRA 15:1)
                         (Steel--Testing)

YANUS, R.I., kand.fiziko-matematicheskikh nauk; VDOVIN, Yu.A., inzh.;
BLINKOV, V.Ya., inzh.; POLOVNIKOVA, L.A., inzh.

Properties of cold-rolled steel in reels for use in electric
transformers. Vest. elektroprom. 32 no.9:62-63 S '61.
(MIRA 14:8)

(Electric transformers) (Steel--Magnetic properties)

21802

9,2530
9,6000 (1040, 1089, 1067)

AUTHORS: Kadochnikov, A. I., Fridman, L. A., Yanus, R. I. (Sverdlovsk)

TITLE: Theory of the selective rectification of even numbered
              potential harmonics by using symmetrical non-linear electric
              resistors

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 4, 1961, 501-508

TEXT: In the present paper one of the circuits (Fig. 2) for selective
rectification of even numbered potential harmonics is investigated. This is
built with symmetrical non-linear resistors. The application of this cir-
cuit is shown in the output circuit of a ferro-probe (or a magnetic
amplifier of a type with even numbered harmonics). In order to rate the
sensitivity of such a ferro-probe a simple formula has been derived. Expe-
rimental data are brought that confirm the theoretical conclusions. A dis-
continuity near a certain point on the static characteristic of the sym-
metric non-linear resistors will have an essential influence on the sensitiv-
ity of this circuit. A circuit of symmetrical non-linear resistors which
has been brought by R. Ya. Berkman (Ref. 9: "Fazovyy detektor na kratnyye

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Theory of ...

21802

S/103/61/022/004/009/014
B116/B212

chastoty." (Phase discriminator for multiple frequencies). Avtomatika i telemekhanika, v. 19, no. 4, 1958) is very advantageous in this respect. But his formula can only be applied to some special cases. This paper brings a sufficiently accurate and also simple solution for that circuit, its correctness has been proved by trial. It is shown that the constant component of the current flowing through the load resistance R_B will be proportional to the mean value of the sum of the even numbered harmonics which belong to the potential measured in the band width τ. The circuit investigated may also be used to rectify the even numbered harmonics of the emf generated in the output coil of the ferro-probe (or of a magnetic amplifier of the type with even numbered harmonics). The constant current component, which has been described above, is essentially a function of the load resistance R_B and the resistance R_c where the blocking potential originates. The sensitivity of the ferro-probe may be approximately calculated with the formula

$$\frac{I}{H_0} \approx - \frac{nS\mu_{d \cdot max} \, f}{\sqrt[3]{R_B^2 \, (\bar{R}_G + R_{\sigma 1})}}$$

(25);

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B116/B212

and the approximate calculation of the current gain for a magnetic amplifier having an equivalent output circuit may be done with

$$\frac{I}{I_o} \approx -\frac{\frac{S}{1} n\, n_o\, \mu_{d.max}\, f}{\sqrt[3]{R_B^2\, (\bar{R}_G + R_{\sigma 1})}} \qquad (26),$$

where $R_{\sigma 1}$ and $R_{\sigma 2}$ denote the load resistances; $R_{\sigma 1}$ contains half of the ohmic resistance of coil II; $\bar{R}_G$ represents a certain mean value of the resistance of the rectifier component; μ_d denotes the differential permeability of the core; n the number of turns of the indicator coil; S the area of the core cross section; f the exciting frequency; I the control current; n_o the number of turns of the control coil; l the length of the magnetic path of the core; H_o the "control" field. There are 7 figures, 1 table, and 9 references: 7 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: Miles I. G. Types of Magnetic Amplifiers Survey. Trans. AIEE, vol. 71, 1952; Frost-Smith E. H. The Study
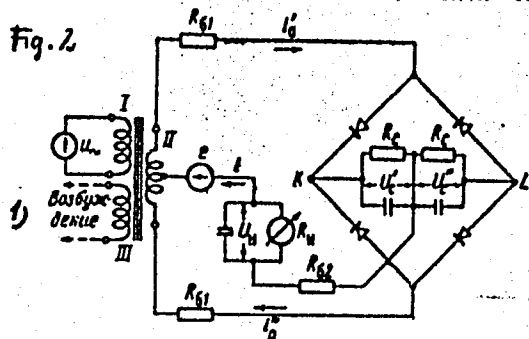
Card 3/4

21802

Theory of ...

of a Magnetic Inverter for Amplification of Low - Input - Power D. C.
Signals. IEE, vol. 100, no. 76, Part II, 1953.

SUBMITTED: June 24, 1960

Legend to Fig. 2:
1) Excitation.

Fig.2

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37698.

18.8100

AUTHORS: Subbotina, Z.S., Shturkin, D.A., Yanus, R.I.

TITLE: On the fields of surface defects in ferromagnetic
             bodies with residual magnetization

TEXT: Description of an apparatus for the measurement of the
radial and azimuthal components in the magnetic field near the
surface of steel cylinders with quenching and very fine cracks
which are perpendicular to the direction of magnetization,
small cavities and also regions of non-uniform structure.   The
probe consists of a Permalloy 79HM (79NM) rod (length 2.5 mm,
diameter 0.048 mm) with an excitation coil of 120 turns and an
indicator coil of 150 turns.   The excitation field is sinusoidal
(24 Oe, 160 Kc/s).   Signals from the probe are measured by tube
voltmeters and presented as Lissajous figures on an oscilloscope.
The samples were 24 mm long, 23 mm diameter bearing rollers of
ЩX15 (ShKh15) steel.   On three particular rollers out of the
Card 1/2

On the fields of surface ...

S/126/62/013/004/006/022
E039/E435

large number examined the following defects were investigated:
Roller no.1: a fine crack, length 11 mm, depth 0.1 to 0.3 mm,
width 0.06 to 0.1 mm.   No.2: a quenching crack along the full
length of the roller, depth 5 to 8 mm, width 0.1 to 0.2 mm.
No.3: a depression 1 to 3 mm wide and about 0.1 mm deep.
Detailed results are given of the magnetic field configuration at
these defects.   The form of the fields observed are considered
on the basis of the formation of a magnetic dipole at the cracks
and equations are given for the radial and azimuthal components of
the field.   Reasonable agreement is obtained between calculated
and experimental values of the fields.   There are 6 figures and
1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR
             (Institute of Physics of Metals AS USSR)

SUBMITTED: August 26, 1961 (initially)
             November 9, 1961 (after revision)

Card 2/2

ZATSEPIN, N.N.; SHCHERBININ, V.Ye.; YANUS, R.I.

Measurement of inhomogenous magnetic fields by means of magnetometric probes. Fiz. met. i metalloved. 14 no.1:30-34 Jl '62.
(MIRA 15:7)
(Magnetic fields—Measurement)

YANUS, R.I.

Theory of iron-probe magnetometers for heterogenous magnetic
fields. Fiz. met. i metalloved. 14 no.3:366-373 S '62.

(MIRA 15:9)

1. Institut fiziki metallov AN SSSR.

(Magnetic fields—Measurements)

VLASOV, V.V.; MEL'NIKOVA, V.A.; YANUS, R.I.

Influence of the demagnetizing effect on the rate of establishing a magnetic induction flux in a ferromagnetic material. Fiz. met. i metalloved. 16 no.6:842-847 D '63.   (MIRA 17:2)

1. Institut fiziki metallov AN SSSR.