L 15536-63
ACCESSION NR: AP3005214   2

purely molecular spectra and that can be used to solve intricate spectroscopic
problems. Examples are given where the quasilinear spectra are used to determine
small deformations of molecules. Results of such studies were found to agree
closely with results in which purely vibrational spectra were used. However, the
application of selection rules to the two types of spectra shows that, for some
compounds (phenanthrene and pyrene), the number of allowed frequencies obtained
by vibrational analysis of the quasilinear spectra is considerably larger than
the number of totally-symmetric vibrations predicted by group theory. This dis-
crepancy is attributed to either slight deformation of these molecules in the
frozen paraffin matrix, or to certain perturbations, not discussed specifically
in the article. Some simple regularities are noted in the vibrational frequen-
cies obtained by vibrational analysis of the quasilinear spectra of different
polynuclear aromatic hydrocarbons, including the existence of common frequencies
among different hydrocarbons and the effect of molecular symmetry on the inten-
sities of these common frequencies. The nature of multiplets observed in quasi-
linear luminescence spectra is discussed, with particular application to coronene.
Some hitherto unexplained phenomena are attributed to the fact that by varying
the wavelength of sharply monochromatic excitation it is possible to alter the
distribution of intensity among the multiplet components of the quasilinear

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ACCESSION NR: AP3005214

spectra. The origin of the quasilinear spectra is investigated from the point of view of crystal chemistry and from the point of view of the solid state phenomena occurring during the interaction between the active emission and absorption centers in the solvent crystals. Several methods used to obtain quasilinear spectra are described, and the relations between host and guest molecules are detailed. It is emphasized that when the properties of the components differ greatly, the formation of a true solid solution is impossible, and consequently the normal paraffin based complexes which are used in the methods of obtaining quasilinear spectra are assumed to be inclusion-type compounds. Arguments are presented in favor of this hypothesis. It is shown finally that the mechanism of the origin of quasilinear spectra can be treated as a problem in solid state physics, particularly in view of the recent work by Rebane and Khizhnyakov (Eleventh Conference on Luminescence, Minsk, September 1962), who took into account the interaction between the umpurity molecule and the rest of the crystal, with a far reaching analogy between the mechanism whereby gamma lines appear with their natural widths in a crystalline solid in the mossbauer effect, and the narrow "lines" in an optical quasilinear spectrum. It is shown that "phononless" lines can appear in special transitions, in complete analogy with the Mossbauer "recoilless" transitions, and that in both cases one is dealing with a quantum

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ACCESSION NR: AP3005214 O

phenomenon (this is why low temperatures must be used). A mathematical basis for
the possibility of "phononless" transitions and lines has been provided independ-
ently by E. D. Trifonov (DAN SSSR v. 147, 826, 1962). and by Rebane and
Khizhnyakov (Opt. i spektr. v. 14, 362, 491, 1963). The latter show that inter-
action with the lattice vibrations does not broaden the phononless lines, but
basically amounts to the appearance of a background; this too, is in complete
analogy with the Mossbauer effect. Some experimental data that favor the validity
of the Rebane and Khizhnyakov theory are mentioned in conclusion. Orig. art. has
14 formulas, and 1 table.

ASSOCIATION: None

SUBMITTED: 00   DATE ACQ: 15Aug63   ENCL: 00

SUB CODE: PH, CH   NO REF SOV: 023   OTHER: 016

Card   4/4

SHPOL'SKIY, E.

"From radioactive thorium to the fission of uranium" by Otto Hahn.
Reviewed by E.Shpol'skii. Usp. fiz. nauk 80 no.3:521-522 Jl
'63. (MIRA 16:9)
(Hahn, Otto)

High-energy physics and the nature of matter. Usp. fiz. nauk 86
no.4:389-590 Ag '65.   (MIRA 18:8)

SHPOL'SKIY, E.V., doktor fiziko-matem.nauk

Spectrum analysis of complex molecules (to be concluded). Priroda
54 no.10:22-31 '65.   (MIRA 18:10)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V.I.
Lenina.

NIKOL'SKIY, L.V., doktor fiz.-mat. nauk

Spectrum analysis of complex molecules. Priroda 54 no.11:
6-16 '65. (MIRA 18:11)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut im.
V.I. Lenina.

L 8096-66   EWT(1)

ACC NR: AP5026316   SOURCE CODE: UR/0026/65/000/010/0022/0029

AUTHOR: Shpol'skiy, E. V. (Doctor of physico-mathematical sciences)

ORG: Moscow State Pedagogic Institute im. V. I. Lenin (Moskovskiy gosudarstvennyy pedagogicheskiy institut)

TITLE: Spectral analysis of complex molecules

SOURCE: Priroda, no. 10, 1965, 22-29

TOPIC TAGS: molecular spectroscopy, molecular property, molecular theory, complex molecule

ABSTRACT: In the first of a two-part article, the author discusses the Shpol'skiy effect which serves in numerous Soviet and other world laboratories for the sensitive and exact qualitative and quantitative analysis of complex organic compounds and for the discovery of which the author was awarded the im. S. I. Vavilov Gold Medal by the Presidium of the AN SSSR in 1962. A comprehensive pedagogical introduction into the theory and practice of electron and molecular spectroscopy is followed by a discussion on the quasi-line spectral effect. When certain substances are studied not in the form of pure crystals but in frozen crystalline solutions (i.e., when small admixtures are added to crystals of very different nature), the spectra obtained at low temperatures may exhibit line characteristics close to

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UDC: 543.42

L 8096-66
ACC NR: AP5026316

those in the case of gases. The molecules producing the spectrum are in the so-called "oriented gas" state, and the author gives illustrative examples of specific situations. A preliminary discussion of the possible theoretical explanation (developed by Estonian physicists K. K. Reba and V. V. Khizhnyakov) of the effect (which is analogous to the Mossbauer effect of nuclear physics) is presented. Orig. art. has: 3 figures.

SUB CODE: OC, OP / SUBM DATE: none / ORIG REF: 01 / OTH REF: 001

Card 2/2

L 3150-66   EWT(1)/T/EEC( )-3   IJP(c)
ACCESSION NR: AP5016054   UR/0368/65/002/005/0475/0478
                                                 771.533

AUTHORS: Kalinkina, T. A.; Oshurkova, A. N.; Pankova, A. A.;
Uvarova, V. M.; Chistova, G. I.; Shpol'skiy, M. R.

TITLE: NIKFI photographic materials for spectral analysis in the
ultraviolet region of the spectrum

SOURCE: Zhurnal prikladnoy spektroskopii, v. 2, no. 5, 1965, 475-478

TOPIC TAGS: uv spectroscopy, uv photography, photographic material,
photographic emulsion

ABSTRACT: The authors describe briefly the assortment of photographic
materials developed for the registration of the ultraviolet region
of the spectrum. The spectral sensitivity of the materials and the
dependence of the contrast of the emulsions on the wavelength of the
applied radiation is reported. It is shown that emulsions having a
high content of silver halide exhibit an increase in the absolute
sensitivity of the layers in the ultraviolet region of the spectrum

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L 3150-66

ACCESSION NR: AP5016054

3

compared with the visible region. The deviation from the reciprocity law for prolonged exposures is determined for some types of emulsions. The resolution of the material is claimed to be sufficiently high even in the case of the coarse-grain emulsions UFSh-0. A table summarizing the characteristics and some of the characteristic curves are included. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (All-Union Scientific-Research Institute of Motion Picture Photograph-)

SUBMITTED: 00　　　　　　　　ENCL: 00　　　　SUB CODE: ES, OP

NR REF SOV: 004　　　　　　OTHER: 000

Card 2/2

39298
S/048/62/026/007/029/030
B117/B144

`14.3430`

AUTHORS: Uvarova, V. M., Sukhodrev, N. K., Pankova, A. A.,
              Shpol'skiy, M. R., and Kovanova, A. N.

TITLE: New photomaterial of the NIKFI for spectrum analyses in the
              short-wave region of ultraviolet radiation

PERIODICAL: Akademiya nauk SSSR.   Izvestiya. Seriya fizicheskaya, v. 26,
              no. 7, 1962, 967-968

TEXT: This report given at the XIV Soveshchaniye po spektroskopii
(XIV Conference on Spectroscopy) deals with new films for vacuum ultra-
violet radiation. The ГМ-1Л (RM-1L) film with highly sensitive emulsion
sensitized with luminohpores had been developed by the NIKFI
(A. O. Kondakhchan) and the Shostkinskiy khimicheskiy zavod (Shostka
Chemical Plant). The УФ-НИКФИ (UF-NIKFI) film little sensitive to
visible light, with an emulsion consisting of highly concentrated silver
halide and small amounts of gelatin, was produced by a method (thin-layer
separation) developed by K. S. Bogomolov, M. Yu. Deberdeyev, A.A.Sirotinskiy
and members of the NIIKhIMMASh. The new films, especially UF-NIKFI

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New photomaterial of the NIKFI for...

S/048/62/026/007/029/030
B117/B144

have adequate photographic stability (8 months). Studies with a RdC-6 (DFS-6) vacuum spectrograph to determine the sensitivity of the new films showed that RM-1L and UF-NIKFI is suitable for regions of 3500-700 $\overset{\circ}{A}$ and 1500-200 $\overset{\circ}{A}$, respectively. There are 3 figures.

Card 2/2

UVAROVA, V.M.; SHPOL'SKIY, M.R.

 Reciprocity law failure in the quartz ultraviolet region.
 Zhur. nauch. i prikl. fot. i kin. 8 no.6:446-449 N-D '63.
              (MIRA 17:1)
 1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut
 (NIKFI).

FAINSHTEYN, L.G.; KOVALEV, A.A.N.; FABRIKANT, ...: SUKHOTREV, N.K.; UVAROVA, V.M.; ... , ...

    A graphic material developed by the Scientific Research Institute of Motion Pictures and Photography for the recording of the vacuum ultraviolet region of the spectrum and their characteristics. Zhur. nauch. i prikl. fot. i kin. 9 no.4:284-288 Jl-Ag '64.

                                                      (MIRA 17:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI).

ALEKSEYEVA, A.; SHPOLYANSKAYA, A., kand.tekhn.nauk

Bibliographical handbook "Metal cutting and metal-cutting tools"
by V.P.Kosharnovskii. Reviewed by A.Alekseeva, A.Shpolianskaia.
Stan.i instr. 34 no.4:42-43 Ap '63.   (MIRA 16:3)

1. Starshiy bibliograf Gosudarstvennoy biblioteki SSSR imeni
V.I.Lenina (for Alekseyeva). 2. Glavnyy bibliograf Gosudarstvennoy
biblioteki SSSR imeni V.I.Lenina (for Shpolyanskaya).
                    (Bibliography—Metal cutting)
                  (Bibliography—Metal cutting tools)

SHMCHNANSKAYA, A. I.   Chem. Tech. Sci.

Dissertation: "Investigation of the Mechanical Properties of Grain with Various Moisture Contents Under Static and Impact Compression." Moscow Technological Inst of the Food Industry, 11 Jun 47.

SC: Vechernyaya Moskva, Jun, 1947 (Project #17036)

SHPOLYANSKAYA, A.L.

Wheat

Structural-mechanical properties of wheat grain. Koll. zhur. 14, No. 2, 1952.

Monthly List of Russian Accessions, Library of Congress.   Unclassified.

SHPOLYANSKAYA, A. L.

(3)

6131. DRYING AND CONDITIONING OF WHEAT IN VACUO. Kuprits,
Fuel Abstracts   Ya. N., Shpolyanskaya, A. L. and Rubina, N. K. (Kolloid. Zh.
Vol. 15 No. 2   (Colloid J., Voronezh), May/June 1953, vol. 15, 198-203).
February 1954
Industrial Furnaces,

KRYUKOV, I. S.

Krayukov, "Works on Helminthology" on the 75th Birthday of K. I. Skryabin, Izdat
Akad. Nauk, SSSR, 1952, page 774
Moscow Technical Inst. for Fish Economy

1. SHPOLYANSKAYA, A.Yu.

2. USSR (600)

4. Fishes - Diseases and Pests

7. Changes of the leukocytal composition of blood in fish as affected by the tape helminth Ligula, Dokl.AN SSSR 90 no. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, _____APRIL_____1953, Uncl.

SH....USHKA, A. Yr.

"Infestations of Carp and Their Effect on the Fish Organism." Cand Biol Sci, Moscow Technical Inst of the Fish Industry and Economy, Moscow, 1954. (RZhBiol, No 1, Jan '5)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13) SO: Sum, 500, 29 Jul 55

SHPOLYANSKAYA, A.Yu.

Diseases of eggs and young fish at piscicultural enterprises of
the State Main Administration of Fish Culture. Trudy sov.Ikht.
kom. no.9:81-85 '59.   (MIRA 13:5)

1. Akklimatizatsionnaya stantsiya Rosglavgosrybvoda.
        (Fishes--Diseases and pests)

SHPOLYANSKAYA, A.Yu.

Epizootic state of ponds on collective and state farms of Moscow
Province and measures for controlling fish diseases. Trudy
sov. Ikht. kom. no.14:207-210 '62.   (MIRA 15:12)

1. Moskovskaya rybovodno-meliorativnaya opytnaya stantsiya.
        (Moscow Province--Fishes--Diseases and pests)

LEVINA, TS.A.,professor; SHPOLYANSKAYA, B.I.

Determining the rate of flow of venous and arterial blood as a
functional diagnosis method in various stages of insufficient blood
circulation. Vrach. delo no.1:31-33 Ja '57   (MLRA 10:4)

1. Kafedra propedevtiki vnutrennikh bolezney (zav.-prof. TS. A.
Levina) Odesskogo meditsinskogo instituta.
        (BLOOD--CIRCULATION, DISORDERS OF) (BLOOD PRESSURE)

KHOROSHIY, Izrail Samoylovich; SOROKIN, Nikolay Vasil'yevich;
        KALAKUTSKIY, Vladimir Aleksandrovich; SHPOLYANSKAYA,
        L.M., otv. za vyp.; AVERINA, T.I., red.; SHEVTSOV, V.D.,
        red.; GOLUBKOVA, L.A., tekhn. red.

        [Assembling precast reinforced concrete structures of the
        silo housing of elevators] Montazh sbornykh zhelezobeton-
        nykh konstruktsii silosnykh korpusov elevatorov. Pod red.
        V.D.Shevtsova. Moskva, Zagotizdat, 1962. 83 p.
                                            (MIRA 17:2)

NOVAK, N.Ye., red.; SHPOLYANSKAYA, L.M., otv. za vyp.; D'YACHENKO,
V.M., red.; SAVEL'YANOVA, Z.A., tekhn. red.

[Tula Milling Combine No.1, an enterprise of communist
labor] Tul'skii mel'kombinat No.1 - predpriiatie kommunisti-
cheskogo truda. Moskva, Zagotizdat, 1962. 51 p.
(MIRA 17:4)

SHPOLYANSKAYA, M.I.

Effect of various types of vaccines on the anatoxin and protein
fraction content under experimental conditions. Zhur.mikrobiol.
epid. i immun. 29 no.6:34-37 Je '58   (MIRA 11:7)

1. Iz kafedry mikrobiologii Krymskogo meditsinskogo instituta.
        (DIPHTHERIA, immunology.
            eff. of various vaccines on anatoxin & blood proteins
            (Rus))
        (BLOOD PROTEINS,
            eff. of diphtheria vaccines (Rus))

POPOV, A.I., prof., red.; SHPOLYANSKAYA, N.A., red.; YERMAKOV, M.S.,
      tekhn. red.

    [Geographical permafrost study and periglacial morphology] Voprosy
    geograficheskogo merzlotovedeniia i perigliatsial'noi morfologii.
    Pod red. A.I.Popova. Moskva, Izd-vo Mosk. univ., 1962. 194 p.
                                      (MIRA 15:6)
    1. Moscow. Universitet. Geograficheskiy fakul'tet.
                      (Frozen ground)

SHPOLYANSKAYA, N.A.

Influence of heat exchange conditions between the surface of the
soil and the atmosphere on permafrost in Transbaikalia. Vest.Mosk.
un. Ser. 5: Geog. 17 no.2:37-42 Mr-Ap '62.   (MIRA 15:5)

1. Kafedra geografii polyarnykh stran i glyatsiologii Moskovskogo
universiteta.
    (Transbaikalia--Frozen ground) (Transbaikalia--Earth temperature)

SHPOLYANSKAYA, N.A.

A numerical method of surveying frozen ground using the example of Transbaikalia. Izv. AN SSSR. Ser. geog. no.3:70-77 '64.

(MIRA 17:6)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.

SHPOLYANSKIY, B.; YERGOROV, I.

Automobile repairing is on the agenda. NTO no.9:52-53
S '59.   (MIRA 13:1)

1. Chleny Nauchno-tekhnicheskogo obshchestva lesnoy promyshle-
nnosti, Leningrad.
    (Automobiles--Maintenance and repair)

RESHETNIKOV, N.S., dotsent; SHPOLYANSKIY, B.Yu., starshiy nauchnyy
      sotrudnik; LITVINENKO, T.M., mladshiy nauchnyy sotrudnik;
      VERBITSKIY, I.I., red.; MAKAROVA, L.V., red.izd-va;
      VDOVINA, V.M., tekhn.red.

      [Technical specifications for repairing, assembling, and testing
      after repair TDT-60 tractors] Tekhnicheskie usloviia na remont,
      sborku i ispytanie posle remonta traktora TDT-60. Moskva, Gos-
      lesbumizdat. Pt.2. [Tractor and its units (except the engine)]
      Traktor i ego agregaty (krome dvigatelia). 1961. 149 p.
                                                       (MIRA 14:6)
      1. Moscow. TSentral'nyy nauchno-issledovatel'skiy institut
      mekhanizatsii i energetiki lesnoy promyshlennosti. 2. Nachal'nik
      laboratorii tipovoy tekhnologii remonta mashin i organizatsii
      remontnykh predpriyatiy TSentral'nogo nauchno-issledovatel'skogo
      instituta mekhanizatsii i energetiki lesnoy promyshlennosti (for
      Reshetnikov).
            (Tractors—Maintenance and repair)

SHPOLYANSKIY, B.Yu.; RUDAKOVA, A.F., mladshiy nauchnyy sotr.; ANTONOVA,
G.P., tekhnik; ANIKIYENKO, O.M., tekhnik; RUZIN, S.I., otv. za
vypusk; IOFINOVA, TS.B., red. izd-va; SHIBKOVA, R.Ye., tekhn.
red.

[Album of working drawings of the basic parts and units of the
TDT-60 tractor]Al'bom rabochikh chertezhei osnovnykh detalei i
uzlov traktora TDT-60. Moskva, Goslesbumizdat, Pt.1.[The
D60T engine]Dvigatel' D60T. 1962. 224 p.   (MIRA 15:10)

1. Khimki. TSentral'nyy nauchno-issledovatel'skiy institut
mekhanizatsii i energetiki lesnoy promyshlennosti. 2. Rukovo-
ditel' laboratorii tipovoy tekhnologii remonta mashin i organi-
remontnykh predpriyatiy otdeleniya remonta lesozagotovitel'no-
go oborudovaniya TSentral'nogo nauchno-issledovatel'skogo in-
stituta mekhanizatsii i energetiki lesnoy promyshlennosti (for
Shpolyanskiy).
                    (Tractors--Engines)

POZDNEYEV, M.L., starshiy nauchnyy sotr.; POPKOV, A.G., mladshiy
nauchnyy sotr.; CHERNYSHOV, G.V., mladshiy nauchnyy sotr.;
SHFOLYANSKIY, B.Yu.; VERBITSKIY, I.I., starshiy nauchnyy
sotrudnik, otv. za vypusk; IOFINOVA, TS.B., red. izd-va;
GRECHISHCHEVA, V.I., tekhn. red.

[Album of designs of details of repair dimensions and additional
parts (attachments) of the "Druzhba-60" gasoline engine saw]Al'-
bom chertezhei detalei remontnykh razmerov i dopolnitel'nykh de-
talei (nasadkov) benzinomotornoi pily "Druzhba-60." Moskva,
Goslesbumizdat, 1962. 14 p.   (MIRA 15:12)

1. Khimki.TSentral'nyy nauchno-issledovatel'skiy institut mekha-
nizatsii i energetiki lesnoy promyshlennosti. 2. Rukovoditel' la-
boratorii tipovoy tekhnologii remonta mashin i organizatsii re-
montnykh predpriyatiy TSentral'nogo nauchno-issledovatel'skogo
instituta mekhanizatsii i energetiki lesnoy promyshlennosti.
                        (Saws)

POZDNEYEV, M.L., starshiy nauchnyy sotr.; POPKOV, A.G., mladshiy
    nauchnyy sotr.; SHPOLYANSKIY, B.Yu.; VERBITSKIY, I.I.,
    starshiy nauchnyy sotn.,otv. za vypusk; MYAKUSHKO, V.P.,
    red.izd-va; SHIBKOVA, R.Ye., tekhn. red.

[Technological processes in the reconditioning (repair) of
worn-out parts of the ZIL-157 motortruck] Tekhnologicheskie
protsessy vosstanovleniia (remonta) iznoshennykh detalei avto-
mobilia ZIL-157. Moskva, Goslesbumizdat. Pt.2. [Chassis
except engine] Shassi, krome dvigatelia. 1962. 342 p.

1. Khimki. TSentral'nyy nauchno-issledovatel'skiy institut
mekhanizatsii i energetiki lesnoy promyshlennosti. 2. Rukovo-
ditel' laboratorii tipovoy tekhnologii remonta mashin i orga-
nizatsii remontnykh predpriyatiy TSentral'nogo nauchno-
issledovatel'skogo instituta mekhanizatsii i energetiki lesnoy
promyshlennosti (for Shpolyanskiy).
        (Motortrucks--Maintenance and repair)

SHPOLYANSKIY, D.I. [author]; GEFTER, M.Ya. [reviewer].

"Monopolies of the coal and metallurgical industry of South Russia at the beginning of the 20th century." D.I.Shpolianskii. Reviewed by M.IA.Gefter. Sov.kniga no.8:76-80 Ag '53.   (MLRA 6:8)

(Monopolies) (Shpolianskii, D.I.)

KOSOV, A.P.; MAGAY, L.I.; NIKULIN, B.K.; PAK, M.S.; RUDAKOV, G.M.;
    SAYFI, E.Kh.; SERGIYENKO, V.A.; SOKOLOV, F.A.; SPIRIDONOV,
    P.V.; SHPOLYANSKIY, D.M.; TIKHONOVA, I., red.

[Overall mechanization and cultivation practices for cotton
crops] Kompleksnaia mekhanizatsiia i agrotekhnika khlop-
chatnika. Tashkent, Gos.izd-vo Uzbekskoi SSR, 1964. 407 p.
                                            (MIRA 17:11)
1. Sredneaziatskiy institut mekhanizatsii i elektrifikatsii
sel'skogo khozyaystva. 2. Sredneaziatskiy institut mekhani-
zatsii i elektrifikatsii sel'skogo khozyaystva (for all
except Tikhonova).

SHKOLYANSKIY, G. I.

USSR/Aeronautics   Mar 1947
     Motors, Aircraft
     Instruments, Aeronautical

"Device for Measuring the Average Indicator Pressure of Aviation Motors in Flight,"
A. E. Sheyndlin, G. I. Shkolyanskiy, 2 pp

"Tekh Voz Flota" No 4

At the present time, there is no device for direct measurement of the average in-
dicator pressure of a multicylinder aviation motor. The article sets forth a plan
for such a device based on the principle of the retardation of gas in its flow
through a resistance.

1A 29T1

ACC NR: AP6033618   SOURCE CODE: UR/0136/66/000/010/0070/0073

AUTHOR: Ivanov, I. A.; Shpolyanskiy, L. Ya.

ORG: none

TITLE: New plate and sheet rolling plant

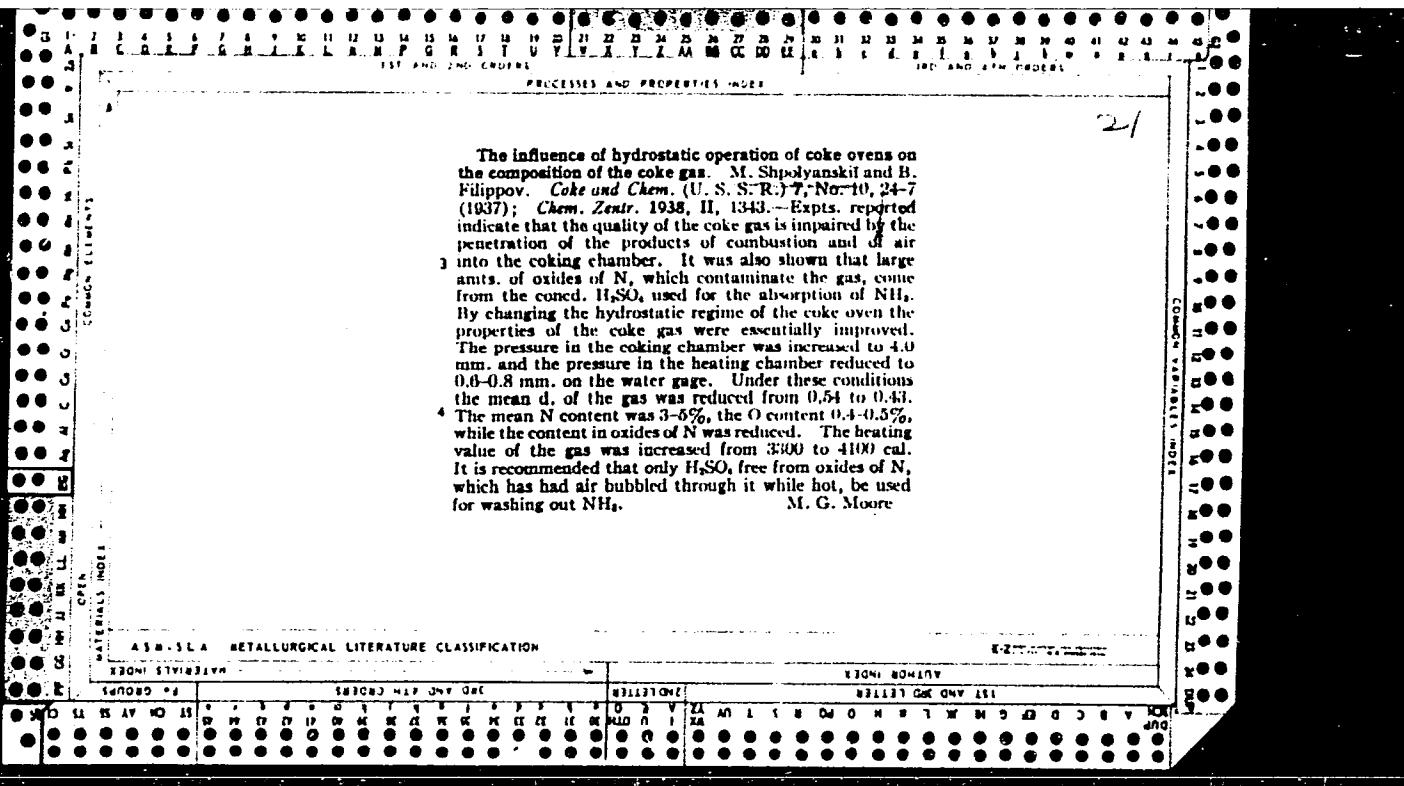SOURCE: Tsvetnyye metally, no. 10, 1966, 70-73

TOPIC TAGS: aluminum alloy, sheet, aluminum alloy plate, alloy sheet rolling, alloy plate, rolling, rolling plant, rolling mill

ABSTRACT: Plans were made in 1964 for a new plant [located unidentified] which will roll alluminum-alloy sheets and plates. The plant will be equipped with a high-rigidity four-high mill with working rolls 800 mm in diameter and backup rolls 1500 mm in diameter. The roll lengths will be 1800 mm. This mill will roll conditioned (by milling) slabs 270—300 mm thick into plates 7—9 mm thick. The cold rolling will be done in two continuous four-high mills with working rolls 600 mm in diameter and backup rolls 1500 mm in diameter. The roll length will be 1800 mm. Cold-rolled strip will have a final thickness of 0.6—4 mm. Orig. art. has: 2 figures.

SUB CODE: 13.   / SUBM DATE: none/

Card 1/1   UDC: 669.715:621.771.23/24

The influence of hydrostatic operation of coke ovens on the composition of the coke gas. M. Shpolyanskii and B. Filippov. Coke und Chem. (U. S. S. R.) 7, No. 10, 24-7 (1937); Chem. Zentr. 1938, II, 1343.—Expts. reported indicate that the quality of the coke gas is impaired by the penetration of the products of combustion and of air into the coking chamber. It was also shown that large amts. of oxides of N, which contaminate the gas, come from the concd. H_2SO_4 used for the absorption of NH_3. By changing the hydrostatic regime of the coke oven the properties of the coke gas were essentially improved. The pressure in the coking chamber was increased to 4.0 mm. and the pressure in the heating chamber reduced to 0.6–0.8 mm. on the water gage. Under these conditions the mean d. of the gas was reduced from 0.54 to 0.43. The mean N content was 3–5%, the O content 0.4–0.5%, while the content in oxides of N was reduced. The heating value of the gas was increased from 3300 to 4100 cal. It is recommended that only H_2SO_4 free from oxides of N, which has had air bubbled through it while hot, be used for washing out NH_3.   M. G. Moore

ASM-SLA   METALLURGICAL LITERATURE CLASSIFICATION

Increasing the yield of hydrogen in coking A. G. Lethush, M. A. Shpolyanskii and B. P. Kornilov. J. Chem. Ind. (U. S. S. R.) 14, 1389-97(1937). When air contg. H_2O, hydrocarbons or mixts. of these is blown into the bottom of the coking oven, the H_2 yield is increased 12-20%. Coking must be prolonged 2 hrs. to obtain these yields.   H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

21

Measuring the volume of hot gases of variable composition.   A. G. Lelhush and M. A. Shpolyanskii.   Zavod-
skaya Lab. 7, 481-4 (1938).   The method of Litinsky
(Messung grosser Gasmengen 1932, Leipzig) for measuring
the vol. of coke gas with the addn. of measured amts. of
other gases, NH₃, SO₂ is described.   An assembly for
carrying out this method is illustrated and described.
                                              Chas. Blanc

SHPOLYANSKI", M. A.

USSR/Chemistry - Laboratory Equipment   Dec 50

"Apparatus for Continuous Supply of Liquid at Low Rate," M. A. Shpolyanskiy, A. S. Likhacheva, State Inst of Nitrogen Ind

"Zavod Lab" No 12, pp 1500-1502

Under continuous gas pressure liquid is discharged alternately from 2 burettes equipped with thermo-stats. Flow rate is regulated by liquid rheometer. Gas inflow into each burette accomplished by capillaries fused into bottom parts of burettes below scales. By using different capillaries, rate of discharge is varied from 5 to 60 ml/hr.

182T9.

C²H

1

Apparatus for continuous delivery of liquid at a slow rate.
M. A. Shpolyanskii and A. S. Likhacheva. *Zavodskaya Lab.* **16**, 1500-2(1950).—The liquid is delivered by a regulated gas pressure through thermostated burets and a calibrated rheometer. Flow constancy of 1.6% is claimed.

G. M. Kosolapoff

C A

Laboratory installation for preparation of ethane   M. A. Shpolyanskii. *Zhur. Priklad. Khim.* (J. Applied Chem.) 23, 727-33(1950). A simple, easily maintained installation for the production of C_2H_6 is described and a full diagram and flow sheet are given. The process is the electrolysis of NaOAc soln. with smooth Pt electrodes, 10-14 v., and 80-100 amp. With only a 12% conversion factor of the NaOAc, the app. provides 14-16 l. pure C_2H_6 hr., after passage through the purification train. The product contained 95-8% alkane, 0-1.4% olefin, 0.8-1.6% CO, and 0-2.3% H_2, as well as traces of esters, O, and very small amts. of S derivs. (probably from the rubber connectors). The use of 45-60% NaOAc solns. is recommended.   G. M. K.

CA

/0

Laboratory installation for preparation of ethane.   M. A.
Shpolyanskii.   J.   Applied   Chem.   U.S.S.R.   23,   313-9
(1950)(Engl. translation).—See C.A. 45, 1405a.
                                         R. M. S.

1 1 5 1

"Preparation of Hydrogen and Mixtures of It With Nitrogen and Carbon Monoxide From the Reaction of Aliphatic Hydrocarbons with Steam." Cand Chem Sci, Moscow Chemicotechnological Inst, Moscow, 1954. (IL, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13)
SO: Sum. No. 598, 29 Jul 55

SHPOLYANSKIY, M.A.

3990.   PARTIAL CRACKING OF METHANE BY CATALYTIC REACTION WITH STEAM (TO OBTAIN A SUBSTITUTE FOR TOWN'S GAS).   Shpolyanskii, M.A. and Leibush, A.G. (Trud. Nauch.-Issled. Proekt. Inst. Azot. Prom. (Proc. Sci. Res. Plan. Inst. Nitrog. Ind. U.S.S.R.), 1954, (4), 70-81; abstr. in Ref. Zh. Khim. (Ref. J. ... 1955, (22), 53139).

ARTYUSHENKO, G.V.; SHPOLYANSKIY, M.A.

Preparative method for obtaining pure methane. Gaz. prom. 10
no.4:46-48 '65.   (MIRA 18:5)

SHPOLIANSKII, M. N. and TROFILOV, A. N.

15 let trolleibusnogo transporta v Moskve. /15 years of trolleybus transportation in Moscow/ (Gorodskoe khoz-vo Moskvy, 1948, no. 8, p. 26-31, illus.).

DLC: HD4677. M6G6

SO: Soviet Transportation and Communications, A Bibliography, Library of Congress
Reference Department, Washington, 1952, Unclassfied.

1. SHPCLYANSKIY, M. N., Eng.

2. USSR 600

4. Moscow - Trolley Buses

7. Experience in operating new trolley buses and ways of improving them technically, Gor. khoz. Mosk, 23, No. 5, 1949.

9. Monthly List of Russian Accessions, Library of Congress, ___April___ 1953, Uncl.

1. SHPOLYANSKIY M.N.

2. USSR (600)

4. Trolley Buses-Moscow

7. Experience in operating new trolley buses and ways of improving them techni-
cally. E Gor.khoz.Mosk. 23, 1949.

9. Monthly List of Russian Accessions, Library of Congress, _____April_____1953, Uncl.

MARKOVNIKOV, Valerian Leonidovich; SHPOLYANSKIY,M.N., redaktor; AVRU-
    SHCHENKO,P.A., redaktor; PETROVSKAYA,Ye., tekhnicheskiy redaktor

    [Brake systems of trolley buses and trolley cars] Tormoznye sistemy
    trolleibusov i vagonov tramvaia. Moskva, Izd-vo Ministerstva kommu-
    nal'nogo khoziaistva RSFSR, 1955. 145 p.   (MIRA 9:1)
                            (Brakes)

MARKOVNIKOV, Valerian Leonidovich; PERKIS, David Isayevich;
      SHPOLYANSKIY, M.N., red.; OTOCHEVA, M.A., red.izd-va;
      KONYASHINA, A.D., tekhn.red.

      [Trolley buses] Trolleibusy. Izd.2., perer. Moskva,
      Izd-vo M-va kommun.khoz.RSFSR, 1957. 238 p.   (MIRA 12:6)
                      (Trolley buses)

REBROV, Sergey Alekseyevich,; BORODAVKA, A.S., inzh., retsenzent,; DENISENKO,
L.P., inzh., retsenzent,; OL'SHANSKIY, M.A., inzh., retsenzent,;
SHPOLYANSKIY, M.N., inzh., retsenzent,; ALEKTOROV, V.A., kand. tekhn.
nauk, red.; SERDYUK, V.K., inzh., red.

[Trolley buses] Trolleibusy, Kiev, Gos. nauchno-tekhn. izd-vo
mashinostroit. lit-ry, 1958. 278 p.   (MIRA 11:11)
                              (Trolley buses)

ALEKSEYEV, Aleksandr Petrovich; KAPITANOVSKIY, Lev Nikolayevich; TASTEVAN,
        Yevgeniy Edmundovich; CHEZHIK, Nikolay Ivanovich; SHPOLYANSKIY,
        Mikhail Naumovich; YERMOLAYEV, M.P., inzh., retsenzent; VOSKRESENSKIY,
        N.N., inzh., red.; TIKHANOV, A.Ya., tekhn.red.

        [All-metal streetcars; design, manufacture, and operation] TSel'no-
        metallicheskii tramvainyi vagon; konstruktsiia, tekhnologiia.
        proizvodstva i ekspluatatsiia. Moskva, Gos.nauchno-tekhn.izd-vo
        mashinostroit. lit-ry, 1958. 287 p.   (MIRA 11:7)
                    (Streetcars)

YEFREMOV, I.S.; SHPOLYANSKIY, M.N., red.; AVRUSHCHENKO, R.A., red.izd-va;
        VOLKOV, S.V., tekhn.red.

        [Electric equipment of trolley buses] Elektricheskoe oborudovanie
        trolleibusov. Izd. 2., ispr. i dop. Moskva, Izd-vo M-va kommun.
        khoz. RSFSR, 1958. 395 p.   (MIRA 12:2)
                                (Trolley buses)

YEFREMOV, Ivan Semenovich; GUSHCHO-MALKOV, Boris Petrovich; SHPOLYANSKIY, M.N., red.; OTOCHEVA, M.A., red.izd-va; LELYUKHIN, A.A., tekhn.red.

[New method of measuring the tension of contact network wires]
Novyi metod izmereniia natiazheniia provodov kontaktnoi seti.
Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1959. 38 p.

(MIRA 13:12)

(Electric railroads--Wires and wiring)

TROFIMOV, A.N.; SHPOLYANSKIY, M.N.

    Twenty-fifth anniversary of the Moscow trolley-bus transportation
system. Gor.khoz.Mosk. 33 no.2:23-25 F '59.   (MIRA 12:3)
               (Moscow--Trolley buses)

PERKIS, David Isayevich; SHPOLYANSKIY, M.N., red.; RACHEVSKAYA, M.I.,
    red.izd-va; SALAZKOV, N.P., tekhn.red.

   [Repair of trolley buses; manual for mechanics] Remont trollei-
busov; uchebnoe posobie dlia slesarei. Moskva, Izd-vo M-va
kommun.khoz.RSFSR, 1960. 257 p.   (MIRA 13:10)
       (Trolley buses--Maintenance and repair)

BONDAREVSKIY, Dmitriy Ivanovich, dotsent, kand.tekhn.nauk; YERMAKOV,
Nikolay Dmitriyevich, inzh.; LIBERMAN, Grigoriy Ruvimovich,
inzh.; OVECHNIKOV, Yevgeniy Vasil'yevich, kand.tekhn.nauk;
CHERTOK, Mark Semenovich, inzh.; SURGUCHEV, V.D., dotsent,
retsenzent [deceased]; VOLOCHNEV, V.N., otv.red.;.GALONEN, Yu.M.,
kand.tekhn.nauk, red.; TROFIMOV, A.N., red.; SHPOLYANSKIY, M.N.,
red.; NIKOLAYEVA, T.A., red.; LELYUKHIN, A.A., tekhn.red.

[Engineering handbook on city electric railroad transportation in
three volumes] Tekhnicheskii spravochnik po gorodskomu elektro-
transportu v trekh tomakh. Moskva, Izd-vo M-va kommun.khoz. RSFSR.
Vol.2. [Streetcar transportation] Tramvai. Otv.red.V.N.Volochnev.
1960. 565 p.   (MIRA 13:7)
           (Street railways)

YEFREMOV, I.S., doktor tekhn. nauk; REKITAR, R.A., inzh.;
ROZENBERG, S.V., kand. ekon. nauk; BLATNOV, M.D., kand.
tekhn. nauk; VIL'KONETSKIY, M.S., inzh.;TOMILIN, A.I., inzh.;
POPELYASH, V.N., inzh.; ZAGAYNOV, N.A., kand. tekhn. nauk;
FINKEL'SHTEYN, B.S., inzh.; MARINOV,I.A., inzh.; ISTRATOV, V.P.,
inzh.; MARGOLIN, I.S., inzh.; ENGEL'S, G.G., inzh.; ANTONOV,
V.A., inzh.; SOKOLOV, V.D., inzh.; KLESHCHINSKIY, B.K., inzh.;
IL'INSKIY, A.I., retsenzent; PAPKOV, N.G., retsenzent; SMIRNOV,
G.M., retsenzent; SHPOLYANSKIY, M.N., otv. red. toma; VOLOCHNEV,
V.N., red.; TROFIMOV, A.N., red.; RACHEVSKAYA, M.I., red. izd-va;
LELYUKHIN, A.A., tekhn. red.

[Technical manual on city electric transportation in three
volumes] Tekhnicheskii spravochnik po gorodskomu elektro-
transportu v trekh tomakh. Redkollegiia: V.N.Volochnev, A.N.
Trofimov, M.N.Shpolianskii. Moskva, Izd-vo M-va kommun. khoz.
RSFSR. Vol.1. [City electric transportation (general part)]
Gorodskoi elektricheskii transport (obshchaia chast'). Otv.
red. toma M.N.Shpolianskii. 1961. 726 p.   (MIRA 15:4)
            (Streetcars)   (Trolley buses)

MARKOVNIKOV, Valer'yan Leonidovich; PERKIS, David Isayevich;
    SHPOLYANSKIY, M.N., red.; BALKOVSKAYA, I.Z., red.izd-va;
    SALAZKOV, N.P., tekhn. red.

[Textbook for trolley bus drivers] Uchebnoe posobie dlia
voditelia trolleibusa. Moskva, Izd-vo M-va kommun.khoz.
RSFSR, 1963.   247 p.   (MIRA 16:10)
                    (Trolley buses)

SHPOLYANSKIY, V.A., inzh.

Electronic instrument for checking watch mechanisms. Nauch.dokl. vys.shkoly; mash.i prib. no.2:198-204 '58. (MIRA 12:10)

1. Predstavleno kafedroy "Pribory tochnoy mekhaniki" Moskovskogo vysshego tekhnicheskogo uchilishcha im. Baumana.
(Electronic instruments)

119-58-5-11/11

AUTHORS: Smirnov, N.M., Shpolyanskiy, V.A.

TITLE: An Electronic Device for the Amplitude Measuring of the
Oscillations of a Balance and Sound Defectoscopy of Clockworks
(Elektronnyy pribor dlya izmereniya amplitudy kolebaniy balansa
i zvukovoy defektoskopii chasov)

PERIODICAL: Priborostroyeniye, 1958, Nr 5, pp. 31-32 (USSR)

ABSTRACT: The newly developed device A D -1 consists of:
1 microphone - transducer
1 microphone amplifier
1 detector
1 limiting amplifier
1 additional amplifier
1 indicator (Braun tube)
1 generator for the rotation of the electron beam with
1 multivibrator and with
1 amplifier
1 measuring multivibrator
1 relaxation multivibrator.
The disturbing noises of the clock are recorded by the microphone

Card 1/2

119-58-5-11/11

An Electronic Device for the Amplitude Measuring of the
Oscillations of a Balance and Sound Defectoscopy of
Clockworks

and, after previous amplification, are led to two channels: the
detector and the limiting amplifier.
Inside the detector the impulse form, which differs according to
different faults in the clock is recorded after the circular
motion of the electron beam has been put into operation by way
of the second channel by means of the limiting amplifier. From
the oscillograms obtained the sources responsible for faults can
be very well ascertained visually. If the absolute height of the
amplitude is to be measured it is possible to switch over to the
measuring multivibrator with connected amplifier. There are 4
figures.

AVAILABLE: Library of Congress

1. Laboratory equipment—Characteristics   2. Clocks—Inspection

Card 2/2

USCOMM-DC-55, 138

KURITSKIY, A.M.; SHPOLYANSKIY, V.A.

Approximate analysis of the dynamics of escapement regulators.
Nauch.dokl.vys.shkoly; mash. i prib. no.1:150-162 '59.
(MIRA 12:8)

1. Stat'ya predstavlena kafedroy "Pribory tochnoy mekhaniki"
Moskovskogo vysshego tekhnicheskogo uchilishcha im. Baumana.
(Clocks and watches--Escapement)

SOV/119-59-2-8/17

9(6)
AUTHOR: Shpolyanskiy, V. A., Engineer

TITLE: Electronic Instrument for Acoustic Detection of Defects in the
             Trip Regulators of Watches (Elektronnyy pribor dlya zvukovoy
             defektoskopii spuskovogo regulyatora chasov)

PERIODICAL: Priborostroyeniye, 1959, Nr 2, pp 20-23 (USSR)

ABSTRACT: The instrument ADS-2 is apt for analyzing the defects of a
             watch and to check both the amplitude and the oscillation period
             of the balance-spring system already when assembling the single
             parts. The instrument consists of 3 sets: the amplitude
             measuring set, the period measuring set and that for measuring
             the speed deviations. The first set works like this: the
             motion noises of the watch are picked up by a microphone and
             then transformed into an electrical signal. The latter is
             amplified by a preamplifier as much as is necessary for being
             formed by a cascade generator. The repeater gain amounts
             $5 \cdot 10^4$ and the band width $(2-25) \cdot 10^3$ cycles. In the multistage
             amplifier consting of series-connected triode-amplifiers the
             input impulses are transformed into square pulses. The last
             of these amplifiers is a trigger system by which the front of

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SOV/119-59-2-8/17

Electrical Instrument for Acoustic Detection of Defects in the Trip
Regulators of Watches

the square work impulse is brought back to the original state
of the impulse back at the multistage amplification input. By
this the pulse amplitudes are standardized simultaneously
which is necessary for avoiding large errors for the temporal
demodulation. For the temporal demodulation of the formed
pulses a generator with linearly rising voltage is used. The
instruments are tuned at each other in such a way that the
amplitude of the saw tooth voltage at the time modulator out-
put is proportional to the pulse series length caused by the
noise of the going watch. The pulses thus treated and being
now comparable are recorded by a detector and conducted to
an indicator. The mean sum measuring error of the amplitude
amounts ± 4°. The second part of the instrument ADS-2 measures
the accuracy of a watch within 24 hours by comparing the value
of the phase difference with a calibration frequency. The
measurement is carried out by means of a cathode ray oscil-
lograph which is connected in such a way that every first
impulse which may for example come from the full deflection of
the balance releases the electron beam trace by a special

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SOV/119-59-2-8/17

Electrical Instrument for Acoustic Detection of Defects in the Trip
Regulators of Watches

generator. Simultaneously, the calibration frequency is released
and the difference between both frequencies gives the re-
quired test value integrated over 24 hours. References 1 and 2
report on analyzing different oscillogram shapes and their
decoding of different errors in the watch motion (set 3).
Dimensions of the instrument ADS-2: size: 475 . 370 . 230 mm;
weight: 35 kg, for the voltages: 220/127 v, connected value:
300 w. The model is checked at present. V. Ye. Demidov;
Engineer, took part in the development of the instrument.
There are 7 figures and 6 references, 3 of which are Soviet.

ASSOCIATION: Elektronnaya laboratoriya NIIChasproma (Electronic Laboratory of
NIIChasprom)

Card 3/3

KURITSKIY, A.M.; SHPOLYANSKIY, V.A.

    Effect of various nonlinearities of escapements on their dynamic characteristics. Nacuch. dokl. vys. shkoly; mash. i prib. no.2:248-260 '59.   (MIRA 12:12)

          (Clocks and watches--Escapements)

69941
S/024/59/000/06/021/028
E192/E282

16.9500

AUTHOR: Shpolyanskiy, V. A. (Moscow)

TITLE: General Theory of Synchronised Controllers

ABSTRACT: A method of investigating a class of synchronised con-
trollers (the controllers having a natural oscillation
frequency) is presented. This is applicable to the
investigation of various types of mechanical and
electrical systems. The method is based on the principle
of equivalent linearisation proposed by Krylov and
Bogolyubov (Ref 5). A generalized controller shown in
Fig 1 is considered. The linear portion of the system
consists of an oscillatory system having linear balance
torque and friction torque. The equation of the linear
portion of the system is written as

$$\varphi = \frac{k_1}{T_1{}^2 p^2 + T_2 p + 1} V \qquad \left(p = \frac{d}{dt} \right) \qquad (1.1)$$

Card 1/5   where k_1 is the static transfer coefficient of the system,

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General Theory of Synchronised Controllers

T_1 and T_2 are time constants, V is the perturbing torque and φ is the output quantity. The non-linear portion of the system is formed by the operation non-linearities (non-linear element 1 in Fig 1) and the non-linearities of the oscillatory system (the non-linear element II in Fig 1). The operation non-linearity can usually be represented as a series combination of an inertialess non-linear element and a delay element (see Fig 1). The non-linear elements I and II can be described by

$$V_I = f_I \, (\varphi, \, p\varphi) = \sum_1^N f_{In} \, (\varphi, \, p\varphi) \qquad (1.2a)$$

$$V_{II} = f_{II} \, (\varphi, \, p\varphi) = \sum_1^M f_{IIm} \, (\varphi, \, p\varphi) \qquad (1.2b)$$

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General Theory of Synchronised Controllers

while the delay element is represented by

$$V_{I'} = V_I e^{-\tau p} \qquad (1.3)$$

where τ is the delay time. It is assumed that the parameters of the system are such that the periodic oscillations excited in it are nearly sinusoidal. In this case it is possible to write

$$\varphi \approx \Phi \cos z \qquad \left(\frac{dz}{dt} = \omega\right) \qquad (1.4)$$

where Φ and ω represent the amplitude and the frequency of the oscillations. Eqs (1.2) can be linearized; they are then expressed by Eqs (1.5), where the coefficients k and q are expressed by Eqs (1.6). The transfer function of the system can now be written as Eq (1.7). The expression for the hodograph is given by Eq (1.8), while L_1 and L_2 are defined by Eqs (1.9). The steady state amplitude Φ_c and frequency ω_c of the oscillations can be found from Eqs (2.1a) and (2.2B).

Card 3/5   On the basis of Eq (2.1a) it is found that the relative

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General Theory of Synchronised Controllers

increment for the oscillation period is expressed by
Eq (2.2). Eq (2.2B) which determines the amplitude of
the steady state oscillations, expressed also the energy
balance in the system. The coefficients q and q*
which enter implicitly into Eqs (2.1a) and 2.2b) are
indicated in Tables 1 and 2 for a number of typical non-
linearities encountered in the controllers. The problem
of the differential stability of the regime determined
by Eq (2.2B) is investigated by assuming that the
amplitude is given a small increment $\Delta \Phi$. It is now
necessary to investigate the behaviour of Eq (1.8) at
$\Phi = \Phi_c + \Delta \Phi$. It is shown that the system is stable
if the following condition is fulfilled

$$\left(\frac{dL_1}{d\Phi}\right)_{\Phi_c} \left(\frac{dL_2}{d\omega}\right)_{\omega_c} - \left(\frac{dL_1}{d\omega}\right)_{\omega_c} \left(\frac{dL_2}{d\Phi}\right)_{\Phi_c} > 0 \qquad (3.1)$$

If L_2 is independent of frequency, the above condition
can be expressed approximately by Eq (3.2). The theory
is applied to the study of two practical controllers. The

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General Theory of Synchronised Controllers

relative increase in the oscillation period of these
systems as a function of Φ_c is illustrated in Figs 3
and 4. Eqs (2.1a) and (2.2B) were derived under the
simplifying assumption expressed by Eq (1.4). It is
therefore of interest to investigate what error this
assumption would introduce into the expression for
$\Delta T/T_0$. It is found that the error is less than
0.5×10^{-4}. Such error is admissible in the majority
of engineering applications. There are 4 figures,
3 tables and 9 references, 8 of which are Soviet and
1 French.

SUBMITTED: June 15, 1959

Card 5/5

S/024/60/000/03/007/028
E140/E463

AUTHOR: Shpolyanskiy, V.A. (Moscow)

TITLE: The Noise Stability of Chopper-Bar Regulators

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh
             nauk, Energetika i avtomatika, 1960, Nr 3, pp 57-63 (USSR)

ABSTRACT: The article employs the method developed by Rytov
             (Ref 4) based on correlation theory and the use of
             symbolic equations to analyse the operation of chopper-
             bar regulators with natural period of oscillation, and
             equivalent systems with correlated external forces.
             It is assumed that the mathematical expectation of the
             perturbation applied to the oscillatory system of the
             regulator is zero. It is further assumed that periodic
             oscillations are excited in the system, close to harmonic.
             The Krylov-Bogolyubov equivalent linearization principle
             is applied to the system. The expressions obtained in
             section 3 are applied to two examples: chopper-bar
             regulator with anchor movement with angular vibration;
             chopper-bar regulator with contactless electrical movement
             with variable magnetic field perturbation. There are

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S/024/60/000/03/007/028
E140/E463

The Noise Stability of Chopper-Bar Regulators

1 figure and 8 Soviet references.

SUBMITTED: January 25, 1960

Card 2/2

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KURITSKIY, A.M.; SHPOLYANSKIY, V.A.

Transient conditions and the stability of natural vibrations in escapement regulators. Izv.vys.ucheb.zav.; prib. 3 no.2:52-59 '60.
(MIRA 14:4)

1. Nauchno-issledovatel'skiy institut chasovoy promyshlennosti.
Rekomendovana kafedroy tochnoy mekhaniki.
(Clocks and watches—Escapements)

On the Dynamic Accuracy of Discharge
Regulators With Unstable Pulse

S/115/60/000/009/002/011
83524
B012/B054

simple formulas are obtained. They express the relation between the mean
square deviation of the amplitude and the diurnal change on the one hand,
and the pulse instability on the other, for any discharge regulators.
The formulas obtained permit the accuracy and immunity from disturbance
of discharge regulators of different types to be evaluated, and the ways
of increasing the accuracy to be pointed out for every individual case.
First, the author studies the character of variation of the exciting
pulse of discharge regulators from the point of view of statistical
characteristics. He shows that an accurate investigation gives proof of
the random character of these variations. This is illustrated here with
the aid of an example, Fig. 1 showing the corresponding diagram for the
"Volga" clock. To simplify the problem it may be assumed that the random
amplitudes of any pulse-sequence pair are independent, and that the
pulse process may be regarded as the result of a pulse-amplitude
modulation of the second type (of the pulse sequence by a disturbance of
the type of white noise). Formula (4) is derived for the energy spectrum
of such a process, and Fig. 3 shows the energy spectrum. Next, the
author investigates the influence of instability of the exciting pulse

Card 2/3

On the Dynamic Accuracy of Discharge
Regulators With Unstable Pulse

82524
S/115/60/000/009/002/011
B012/B054

on the parameters of steady natural oscillations in the regulator. Fig. 4
shows the generalized structural diagram of the discharge regulator.
Formula (12) is derived. This is a system of equations expressing the
relation between the amplitude- and frequency fluctuation on the one hand,
and the pulse instability on the other. The first equation of this system
is the Langevin equation of the Brown motion. It is a relaxation equation
with the relaxation time 1/H. Its solution is obtained in the form of (13).
It is shown that H may be termed the coefficient of noiseproof feature.
Passing over to the instantaneous daily variation, formula (20) is
obtained. The first summand under the root of this formula determines the
daily variation deviations which are due to the amplitude variations
owing to the circumstance that the fluctuations are not isochronous. The
second summand determines the diurnal change deviations which are
directly caused by the pulse change. With the aid of the formulas
obtained, some characteristic examples are studied here. It is pointed out
that the dynamical study of the problem makes it possible to estimate the
critical pulse-change velocity at which the oscillation system does no
longer react to these changes. There are 5 figures and 10 references:
9 Soviet and 1 French.

Card 3/3

KURITSKIY, A.M.; CHERNYAGIN, B.M.; SHPOLYANSKIY, V.A.

Current state of the theory and methods of the design of watch
and clock mechanisms. Priborostroenie no.5:5-8 My '61.

(Clocks and watches)   (MIRA 14:5)

I. 10068-63   EPF(n)-2/EWT(1)/EWP(q)/EWT(m)/BDS/T-2/EEC(b)-2/ES(s)-2--
AFFTC/ASD/ESD-3/SSD--Pu-4/Pt-4--GG/WH/IJP(C)
ACCESSION NR: AR3000367   S/0058/63/000/004/E055/E055   77

SOURCE: RZh. Fizika, Abs. 4E372

AUTHOR: Shpolyanskiy, Ya. A.

TITLE: Effect of temperature treatment on the piezoelectric properties of barium titanate ferroelectric ceramics

CITED SOURCE: Sb. Segnetoelektriki. Rostov-na-Donu, Rostovsk. un-t, 1961, 91-95

TOPIC TAGS: Ferroelectrics, barium titanate, piezoelectric modulus, heat treatment

TRANSLATION: A setup which makes it possible to measure the static piezo-modulus in the direct piezo-effect has been used to measure the piezo-moduli d_{33} of a batch of ceramic specimens of $BiTiO_3$ with an excess of 1% of TiO_2, prepared under different heat treatment conditions. It is shown that for specimens having a constant final-annealing temperature, d_{33} decreases

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with increasing temperature of preliminary annealing from 1200 to 1400 degrees C.
At a constant temperature of preliminary annealing, the greatest d_{33}
is possessed by specimens that have gone through final annealing at 1300° C.
From the measurement of the value of d_{33}, its reduction in time (aging)
and the value of Epsilon it follows that the most effective heat treatment
conditions for the specimens of a given batch is preliminary annealing at
temperatures 1220 and 1280 degrees C and final annealing at 1300 degrees C. In
addition to the annealing temperatures, the values of these quantities are also
affected by the remaining technological process. A. Fotchenkov

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L 10040-63   EWT(1)/EPF(n)-2/EWP(q)/EWT(m)/BDS/T-2/EEC(b)-2/ES(s)-2--AFFTC/
ASD/ESD-3/SSD--Pu-4/Pt-4--GG/IJP(C)/WH/JD
ACCESSION NR: AR3000359   S/0058/63/000/004/E051/E051

SOURCE: RZh. Fizika, Abs. 4E343

AUTHOR: Fesenko, Ye. G.; Kramarov, O. P.; Komarov, V. D.; Shpolyanskiy, Ya. A.

TITLE: Investigation of the effect of isomorphous substitution of Ti ions by
Cr, Mn, Co, and Ni ions on phase transformations in BaTiO sub 3

CITED SOURCE: Sb. Segnetoelektriki. Rostov-na-Donu, Rostovsk, un-t, 1961, 96-100

TOPIC TAGS: Barium titanate, effect of isomorphous substitutions, dielectric
properties, piezoelectric modulus

TRANSLATION: An X-ray structural investigation was made of Ba Ti O sub 3 with
different additives, the dielectric constant Epsilon was measured by a resonant
method, and the static piezo-modulus was measured. Replacement of the Ti ions
with Ni and Co ions leads to a reduction in the transition temperature of the
perovskite modification into a hexagon. With increasing Ni concentration, a
decrease in the Curie temperature and in the maximum of Epsilon takes place, and

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at a concentration Ni greater than 2%, the ferroelectric properties disappear. The decrease in the Curie temperature is connected with a decrease of the spontaneous deformation of Ba Ti O sub 3 upon introduction of the Ni ions, while the decrease of Epsilon and the disappearance of the ferroelectric properties with appearance of non-ferroelectric hexagonal modification. The piezo-modulus of specimens with 0.15% nickel does not change, while at 0.5% it decreases to 220-250 absolute units, and at the same time there is a noticeable increase in the stability of the piezo-modulus with time. For specimens with Co, no hexagonal phase is observed up to 8% Co. The piezo-modulus d sub 3 sub 3 in specimens with 1.5-6% Co amounts to 350-450 absolute units and has high time stability. For specimens with Cr and Mn, a characteristic feature is a reduction in Epsilon without a change in the Curie temperature, this being connected with the formation of the hexagonal phase. When the content of Cr and Mn is greater than 2%, the hexagonal phase occupies more than 50% of the volume of the specimen, while the remaining volume contains the perovskite modification with a spontaneous deformation 0.01 which is characteristic of Ba Ti O sub 3. The piezo-modulus does not change upon introduction of Cr and Mn. L. Mirkin

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L 10066-63   EWT(1)/BDS/EEC(b)-2--AFFTC/ASD/ESD-3--IJP(C)
ACCESSION NR: AR3000369   S/0058/63/000/004/E055/E055

SOURCE: RZh. Fizika, Abs. 4E374   *59*

AUTHOR: Shpolyanskiy, Ya. A.; Gann, V. V.

TITLE: Setup for the measurement of the piezoelectric modulus of ferroelectric
materials in the quasi-static mode

CITED SOURCE: Sb. Segnetoelektriki. Rostov-naD"Donu, Rostovsk. un-t, 1961,
147-151

TOPIC TAGS: ferroelectric materials, piezoelectric modulus, measuring apparatus

TRANSLATION: Apparatus is described for the measurement of piezoelectric moduli
with a pulsating load of frequency 100 cps casting on the specimen. An
electromagnet fed through a barretter from the AC line produces a pulsating load
on a specimen loaded with an inertial mass. The electric voltage produced on the
specimen as a result of the direct piezoelectric effect is measured with a
vacuum tube voltmeter A calculation of the equivalent circuit has shown under

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what parameters of the installation is the value of the piezoelectric modulus
proportional to the measured voltage. A method is described for the adjustment
and calibration of the instrument. The accuracy of the measurements of the
piezoelectric modulus is estimated to be 6%. The apparatus can be useful for
commercial enterprises, where it is required to measure piezoelectric moduli of
large batches of specimens. A. Fotchenkov

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2522
S/109/61/006/009/005/018
D201/D302

9.2585 (also 1144)

AUTHORS: Shpolyanskiy, V.A., Tyufyakin, L.S. (Deceased), and
             Korsakov, P.P.

TITLE: Automatic delayed phase frequency control

PERIODICAL: Radiotekhnika i elektronika. v. 6, no. 9, 1961,
             1468 - 1481

TEXT: The transfer function and stability of automatic phase con-
trol is considered first (Figs. 1 and 2). The transfer function
W(p) in operator notation is used of a system linearized for small
deviation from synchronism, induced by random changes in the con-
trolled generator frequency or by fluctuation noise. The inertia
τ_3 of the system, introduced by IF amplifiers can be in simplified
form assumed to be

$$\tau_3 = \frac{n}{\pi \Delta f_{0.7}} \sqrt{\sqrt[n]{2} - 1} \qquad (1)$$

where K_0 – the maximum amplification; hence, (Fig. 1)
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$$W(p) = \cfrac{1}{1 + \cfrac{pe^{\tau_3 p}}{\Delta \omega_s \, K_f(p)}} \qquad (3)$$

can be obtained, where $\Delta \omega_s$ - locking range of the system to the product of maximum transfer coefficients of all stages in synchronism, $K_f(p)$ - the normalized transfer coefficient of the LF filter.

Substituting into (3) the operator transfer coefficient of the proportional integrating filter and going over dimensionless parameters

$$W(p_1) = \frac{\Delta_2 p_1 + 1}{\Delta_1 p_1^2 \, e^{\Delta_3 p_1} + p_1(\Delta_2 + e^{\Delta_3 p_1}) + 1} \qquad (4)$$

is obtained where

$$p_1 = \frac{p}{\Delta \omega_s} = p\tau; \quad \tau = \frac{1}{\Delta \omega_s}; \quad \Delta_1 = \frac{T_1}{\tau}; \quad \Delta_2 = \frac{T_2}{\tau}; \quad \Delta_3 = \frac{T_3}{\tau}. \qquad (4a)$$

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Using the Mikhaylov stability criterion [Abstractor's note: Criterion is given, but it is actually a graphical stability criterion for the zeros of a polynomial] it is found that the system is stable if the delay does not exceed the value of

$$\Delta_{3\text{кр}} = \frac{\frac{\pi}{2} - \text{arc tg } \beta(\Delta_1; \Delta_2) + \text{arc tg } \eta\beta(\Delta_1; \Delta_2)}{\beta(\Delta_1; \Delta_2)} , \qquad (5)$$

where

$$\beta(\Delta_1; \Delta_2) = \sqrt{\frac{\sqrt{(1-\Delta_2^2)^2 + 4\Delta_1^2} - (1-\Delta_2^2)}{2}} ;$$

$$\eta = \frac{\Delta_2}{\Delta_1} .$$

For an integrating filter ($\Delta_2 = 0$) Eq. (5) gives the wellknown value of critical delay time in an automatic phase control system. It is shown that the use of a proportional integrating filter increases the critical value of delay time, compared with that of an integrating filter system. It is of interest in some practical cases to know the dependence of the critical value of the pass band

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of the n-th stage IF amplifier on the parameters of the LF filter.
This dependence is shown graphically indicating that as far as sta-
bility is concerned the minimum pass band could be considerably
narrower than the synchronization range of the system. The interfe-
rence killing feature of the automatic phase frequency control is
considered next. It is assumed that the interference is in the form
of a fluctuation of voltage in the mixer IF amplifiers stage. For
a given power of the signal P_s and a given noise factor F, the fil-
tering properties of a pulse control system are determined by the
noise band given by

$$\Pi_n = \int_0^\infty /N(j\omega)/^2 \ /W(j\omega)/^2 \ d\omega \tag{13}$$

which produces a dispersion of the phase

$$\Delta\theta^2 = \frac{kTF}{2\pi P_s} \Pi_n \tag{12}$$

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where k is the Boltzmann constant and T - absolute temperature.
When the IF passband is considerably wider than that of the closed

loop of phase control $[/N(j\omega)^2 \equiv 1]$ for an integrating filter

$$\Pi_{sh} = \frac{1}{\tau_0} \int_0^\infty \frac{d\xi}{1 + 2\xi \sin \Delta_3 \xi + (1 - 2\Delta_1 \xi \cos \Delta_3 \xi) \xi^2 + \Delta_1^2 \xi^4} \qquad (14)$$

is given, where ξ - dimensionless frequency signal $\xi = \omega/\Delta\omega_s = \omega\tau$.

To evaluate the influence of delay on the magnitude of the effi-
cient noise band it is necessary to calculate the integral in Eq.
(14). It is shown that in an automatic phase control system with
an integrating filter the noise band depends essentially on the
magnitude of the constant Δ_1 of LF filter. A similar effect is

produced in a system with a proportional integrating filter, for
which the noise band is determined by

$$\Pi_{sh} = \frac{1}{\tau} \int_0^\infty \frac{(1 + \Delta_2^2 \xi^2) d\xi}{1 + (1 + \Delta_2^2) \xi^2 + \Delta_1^2 \xi^4 + 2\xi^2 (\Delta_4 - \Delta_1) \cos \Delta_3 \xi - 2\xi (1 + \Delta_1 \Delta_2 \xi) \sin \Delta_3 \xi} \qquad (16)$$

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In certain cases the passband of IF amplifiers is comparable with the passband of the whole system. The author points out that it is possible for the properties of the filtering of the phase control system to be improved by considerable decrease of the IF passband with respect to the passband of the closed loop system and this could be applied to any other IF amplifier arrangement. The quality of the automatic control system is considered last. It may be seen that in an automatic phase control system with integrating filter the low frequency transient has an oscillation character and that the delay in the loop decreases the time lag of phase control. The theory presented by the author was applied to an experimental arrangement of an automatic phase control of the frequency of oscillations of a klystron generator working at $\lambda = 15$ cm range. The reference signal was supplied by the 78th harmonic of a crystal stabilized oscillator working at $f_0 = 26.5$ mc/s. The signal power

P_s was of the order of 1 microwatt. The arrangement made it possible to tune the klystron generator within 60 Mc/s with a locking range of $\triangle \omega_3 = 5$ mc/s and rise time $t_{rt} = 10$ microsecond. The fre-

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quency characteristics of the closed loop system of the automatic phase control with proportional integrating filter are shown for different values of η and time constants $\triangle_1$; the discrepancies bet-ween theoretical and experimental values do not exceed 15 % and there is a good qualitative confirmation of influence of $\triangle_1$ and

$\triangle_2$ on the frequency response of the filtering system. A graph shows that the value of percent regulation in the system decreases with the decrease of the time constant $\triangle_1$ of the filter and with the increase of $\triangle_2$. The increase in $\triangle_2$ shows also a faster res-ponse to the system, e.g. a better regulation characteristic. The experiment is said to be therefore in good overall agreement with theory. There are 17 graphs, and 11 references: 9 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publica-tions read as follows: T.S. George, Analysis of synchronizing sys-tems for interlaced colour television Proc. I.R.E. 1951, 39, 12; W.J. Gruen, Theory of AFC Synchronization Proc. I.R.E. 1953, 41, 8.

SUBMITTED: March 1, 1960
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SHPOLYANSKIY, V.A. (Moskva)

Linear theory of a precision-type electric drive with
a reference time indicator. Izv. AN SSSR. Otd. tekh.
nauk. Energ. i avtom. no.5:182-196 S-O '62. (MIRA 15:11)
        (Electric driving)   (Automatic control)

SHPOLYANSKIY, V.A.; KURITSKIY, A.M.; BAUTIN, N.N., doktor tekhn.
nauk, prof., retsenzent; CHERNYAGIN, B.M., kand. tekhn.
nauk, retsenzent; KUNAYEV, I.P., kand. tekhn. nauk,
red.; BARANOVA, Z.S., inzh., red.izd-va; SOKOLOVA, T.F.,
tekhn. red.

[Release controllers of timing devices] Spuskovye regu-
liatory priborov vremeni. Moskva, Mashgiz, 1963. 463 p.
(MIRA 17:3)

S/115/63/000/001/009/017
E192/E382

AUTHORS: Shpolyanskiy, V.A. and Chernyagin, B.M.

TITLE: Transistorized chronometers

PERIODICAL: Izmeritel'naya tekhnika, no. 1, 1963, 25 - 28

TEXT: A general description is given of electromechanical,
tuning-fork and quartz-crystal chronometers developed by the
NIIChasprom. The electromechanical device is a balance-type,
marine chronometer consisting of two units which are not coupled
mechanically: an electromechanical "trigger" controller producing
current pulses and an indicator hand mechanism driven by the pulses.
The controller comprises a non-split, bimetallic balance. The
amplifier of the chronometer is based on a junction transistor,
type П26Б (P26B), connected in the common-emitter circuit. The
amplifier produces two similar rectangular current pulses for
each oscillation period of the balance so that the pulses are
repeated at the rate of 4 c.p.s. The hand mechanism is based on
a magneto-electrical relay which converts the rocking motion of the
relay frame into the angular motion of cog-wheels. The system is
supplied from two batteries, type CP-4 (OP-4), each of 1.5 V and
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2.5 Ah capacity. The battery lasts 1.5 years. The average daily
deviation of the chronometer is $\pm$ 0.17 sec. The tuning-fork
chronometer consists of the following basic units: a tuning-fork
oscillator; pulse-shaping circuit, frequency-divider; output stage
and hand-type indicator mechanism. The oscillator is provided
either with a bimetallic tuning fork or a monometallic fork made
of a compensated alloy. The frequency of the oscillator can be
adjusted to within $\pm$ 0.005% or $\pm$ 5 sec/day. The stability of the
oscillator at temperatures of 20 ± 10 °C is $\pm 5 \times 10^{-6}$ so that the
maximum daily deviation of the chronometer is 0.75 sec and the
average deviation is +0.22 sec. This satisfies the requirements
of first-class marine chronometers. The quartz-crystal chronometer
contains a quartz oscillator, a pulse-shaping circuit, frequency-
divider system, digital display unit, coincidence circuit and a
re-set circuit. The quartz oscillator is based on germanium
junction transistors and operates at a frequency $f_0 = 125$ kc/s.
The temperature coefficient of the crystal is less than
4×10^{-6}/°C. The divider is based on transistor-plus-ferrite

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