

Semiconductor Two-Terminal Device  
With Negative Resistance

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SOV/109-5-2-16/26

diode with a negative resistance on the forward branch of the volt-ampere characteristic. They used a silver wire with a small donor admixture. The negative resistance appeared after an electric forming with strong currents. The authors reproduced a similar device and discovered a negative resistance on both the forward and return branch of the volt-ampere characteristic, the more stable portion being on the return branch. It is probable that an n-p-n structure developed under the contact. Flat and asymmetrical two-electrode systems of n-p-n and p-n-p types were investigated by U.S. scientists S. L. Miller and J. Ebers (see U.S. refs). There were, however, no comprehensive analyses made of phenomena leading to the development of negative resistance. The authors experimented with two-electrode devices of the p-n-p type constructed by melting indium into electronic germanium. The results of those experiments are given in this paper. The possible mechanics of achieving negative resistance are discussed. Approximated analytical expressions of the volt-ampere characteristic are developed, and some data on the

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performance of these devices in radiotechnical circuits are given. (1) Possible physical processes leading to establishing of a negative resistance in two-electrode semiconductor devices. The mathematical expression for negative resistance in two-electrode semiconductor devices is:

$$R^{(-)} = \frac{-\partial U}{\partial I} \approx \frac{-\Delta U}{\Delta I}. \quad (1)$$

where the minus sign before  $\Delta U$  indicates an increase of conductivity of the device with increase of the current, and a considerable increase of the number of current carriers in the p-n junctions due to impact ionization is possible only if combined with a regenerative process stimulated by a positive feedback in the device. Thus, two conductivity raising sources are required, working together in such a way that the increase of conductivity by one causes a corresponding increase by the other. As the second source, can be used: (1) thermal generation of charge carriers as used in

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DGTse4 to DGTsel2 point contact germanium diodes: these devices have a strong inertial nonlinearity, and parameters strongly dependent on temperature, thus rendering them useless in the high-frequency range; (2) a second p-n junction, with an injection of current carriers increasing with the current increase, the device using the effect of light, the Siener effect, the shift current of the external source imperfectness of the p-n junction at which the reverse voltage is applied. These conditions can be established in the semiconductor structure as shown on Fig. 1. The initial current increase in such a system is achieved by the use of multiplication at the polarity shown in Fig. 1, the junction  $\Pi_1$  (further called emitter) is shifted forward, while the junction  $\Pi_2$  (further called collector) is shifted in the reverse direction. At a voltage lower than the critical  $U_{cr}$ , at which impact ionization begins, a current of the order of the collector saturation flows through the p-n-p structure.

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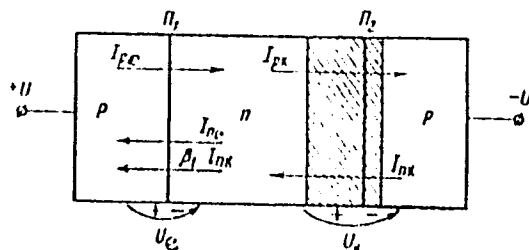


Fig. 1. p-n-p Type structure.

Electrons entering from the collector charge the base negatively, lowering its potential, thus increasing the hole current through the emitter. The ratio of the increase of the full current to the increase of the electron current at the collector junction equals:

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$$\frac{\Delta I}{\Delta I_{nK}} = \alpha' = \frac{1 - \alpha_0^2}{1 - \alpha_0} \quad (3)$$

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where  $\alpha_o = \gamma \beta_2$ ;  $\beta_2 = \frac{\partial I_{pk}}{\partial I_{pe}}$  is transmission coefficient of holes from the emitter to the collector;  $\gamma = \frac{I_{pe}}{I_{pe} + I_{ne}}$  is emitter effectiveness;

$\beta_1$  is coefficient of electron transmission from collector to emitter (here,  $\alpha_o < 1$  and  $\beta_1 < 1$  and, therefore,  $\alpha_e^* > 1$ );  $I_{pe}$ ,  $I_{ne}$ ,  $I_{pk}$ ,  $I_{nk}$  are hole and electron components of emitter and collector currents. The avalanchelike increase of current may lead to a flooding of the collector junction, which causes there a lowering of potential, and subsequent appearance of a negative resistance section of the volt-ampere characteristic. (2)  
Development of an expression for the volt-ampere characteristic of the p-n-p structure in a two-terminal device. Ignoring the part of the electron current reaching the collector junction, in comparison with

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other currents the following two equations are written:

$$I_0 = I_{pe} + I_{ne} + M_n \beta_1 I_{m0}, \quad (4)$$

$$I_0 = M_p I_{p0} + M_n I_{m0}, \quad (5)$$

where  $M_n$  is electron multiplication coefficient;  $M_p$ ,  
hole multiplication coefficient. Coefficient  $\beta_1$

is determined from the equality of the recombination  
currents of holes and electrons in the base:

$$(1 - \beta_2) I_{pe} = (1 - \beta_1) I_{m0}.$$

Considering that  $I = I_e = I_k$  from (4) and (5) follows:

$$I = \frac{I_{m0} M_n (1 - \alpha_0 M_p) + \alpha_0 M_p (1 - \beta_2) I_{pe}}{1 - \alpha_0 M_p}. \quad (6)$$

The currents in Eq. (6) may be found by solving the  
equations of continuity and diffusions, and after sub-  
stituting these values (6) can be transformed into  
(7), where the currents are expressed with reference to  
a unity area of the junction:

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$$J = \frac{1}{1 - \alpha_0 M(U)} \frac{1 - e^{aU}}{e^{aU} - k} (x_0 M(U) J_{ps} D (k+1) - M(U) (1 - x_0 M(U)) J_{ns}), \quad (7)$$

where  $J_{ps}$ ,  $J_{ns}$  are hole and electronic components of the saturation current.

$$a = \frac{q}{kT}; \quad k = \frac{J_{ps} \operatorname{ch} \frac{l}{L_p} (1 - \alpha_0 M)}{J_{ns} + J_{ps} \frac{1}{\operatorname{sh} \frac{l}{L_p}} (1 - \alpha_0 M)}; \quad D = \frac{\operatorname{ch} \frac{l}{L_p} - 1}{\operatorname{sh} \frac{l}{L_p}}$$

$l$  is base width;  $L_p$ , diffusion length of holes. It is assumed that  $U = U_e + U_k$ ,  $M = M_p = M_n$ . This equation is valid only for the beginning of the section of negative resistance, but it permits evaluation of the further behaviour of the p-n-p structure. Equation (7) shows that the shape of the volt-ampere characteristic is basically determined by the term  $1/1 - \alpha_0 M$ .

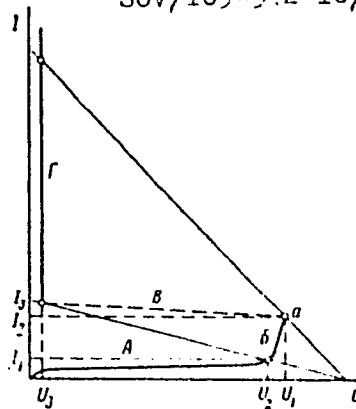
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Figure 2 shows an idealized volt-ampere characteristic.

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Fig. 2. Idealized  
volt-ampere charac-  
teristic of a p-n-p  
type structure.



For  $U \ll U_B$  (where  $U_B =$  breakdown voltage) when  $M = 1$ ,  
the product  $\alpha_0 M < 1$ , and the current flowing  
through the structure is of the order of the  
collector saturation current (area A on Fig. 2).

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For  $U \rightarrow U_B$ ,  $\alpha_0 M \rightarrow 1$ , and the current tends to



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become infinitely large and is limited only by the external resistance  $R$  (area B on Fig. 2); the current is  $I = (E - U_2)R^{-1}$ . With further voltage increase

$\alpha_0 M = 1$ , and the collector is flooded; and at point a of Fig. 2 the transition to a low-resistance stage occurs at:

$$U_1 = U_{10} / (1 - \alpha_0) \quad (8)$$

which can be determined from condition  $\alpha_0 M = 1$ . Area C is unstable ( $M = 1$ ,  $\alpha_0 = 1$ ). For area D  $M = 1$ ,  $\alpha_0 \approx 1$ , and the current is independent of the voltage, being determined by the external resistance. (3) Experiment. For the experiments germanium plates with indium and admixtures melted into the plates in a hydrogen atmosphere were used in the p-n-p structures; the resistivity of the plate was 0.8-0.5 ohm/cm.

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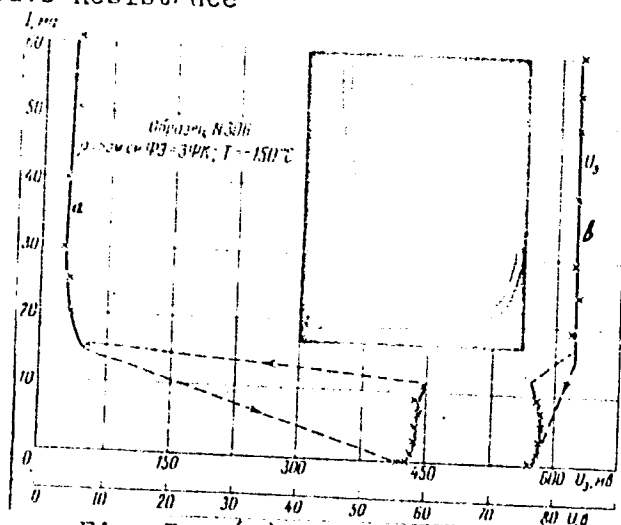


Fig. 3. (a) Experimental characteristic of p-n-p structure and its oscillogram; (b) relation of emitter voltage to current.

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The characteristic measurements were made at low temperatures. Curve b on Fig. 3 illustrates the relation of emitter voltage to current, showing a coincidence of jumping voltage changes on the collector and emitter. The theoretical results for  $U_1$  from (8) agree with experimental data within the investigated range of  $\rho$ . Figure 4 shows the calculation diagram for the relation of transfer voltage  $U_1$  to  $\rho$ . Figure 5 shows experimental graphs for the relation of  $\frac{U_1}{U_B}$  and  $\alpha_0$  to resistivity  $\rho$ . Experiments proved a very pronounced dependence of  $\alpha_0$  on the current when the emitter area was 2-3 times as large as the collector area, which was of the order of  $0.01 \text{ cm}^2$ . Illumination of the collector decreases  $U_1$ . The time of transition to the state of low resistance was 0.1 to 0.35  $\mu\text{sec}$ .

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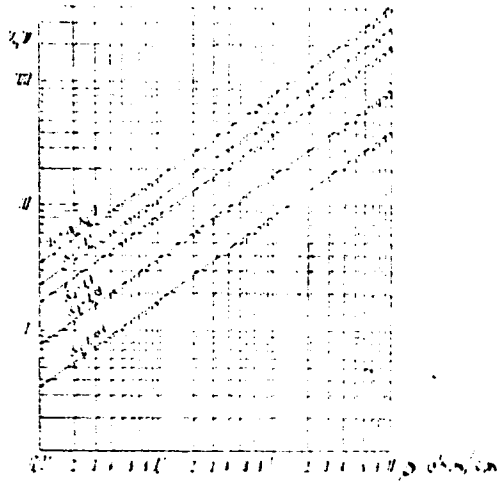


Fig. 4. Relation of transfer voltage  $U_1$  to  $\beta$  for various values of  $\alpha_0$  per Eq. (3).

Relation of relative voltage  $U_1/U_0$  and values of  $\alpha_0$  to  $\beta$ .

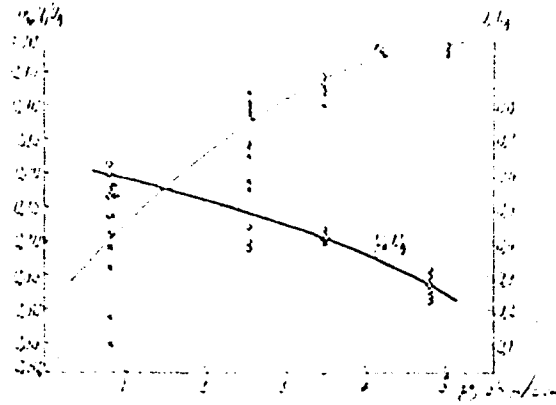


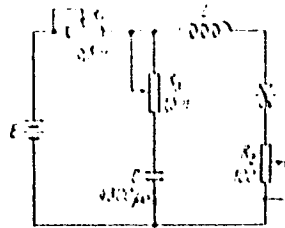
Fig. 5. Relation of relative voltage  $U_1/U_0$  and values of  $\alpha_0$  to  $\beta$ .  
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80V, 100-5-2-16/26

(4) Application of the device. The active non-linearity of the volt-ampere characteristic makes the two-terminal device useful in many changeover and generator circuits.

Fig. 3. Oscillator circuit with a negative resistance device.



This circuit generates saw-tooth oscillation at  $R_3 = 0$ . Resistance changes the oscillation frequency without change of the time constant of the capacitor charging circuit. The low inductivity  $L$  is used to improve the linearity of the output voltage. Oscillograms did show that the nonlinearity of the saw tooth does not exceed 1% for a low inductance.

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Maximum frequency obtained was 1,750 kc. Exclusion of  $R_2$  and  $R_3$  and selection of the working point in the middle of the negative resistance section gives a sinusoidal wave oscillator. A circuit with one equilibrium state is achieved by a selection of a proper  $R_1$  and source voltage E resulting in location of the working point in the D area of the volt-ampere characteristic, and introducing, after elimination of  $R_2$ , positive trigger pulses into the created gap. The minimum amplitude of the trigger pulses is 1-5 v. A circuit with two equilibrium states can be constructed eliminating  $R_3$ , C, and L, and supplying trigger pulses of different polarity through a small capacitor.  $R_1$  and E must be so selected that the straight load line crosses the volt-ampere characteristic in three points. These two-terminal devices can be used with advantage in schemes where point contact devices are usually used. B. M. Vul,

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Semiconductor Two-Terminal Device  
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N. A. Penin, and N. A. Belova helped. There are 10 figures; and 15 references, 7 Soviet, 7 U.S., 1 French. The 5 most recent U.S. references are: J. L. Moll et al., Proc. I. R. E. 1956, 44, 9, 1174; W. Shockley, Tele-Tech., 1957, 76, 8, 58; I. M. Macintosh, Proc. I. R. E., 1958, 46, 6, 1229; W. Read, Bell Systems Techn. J., 1958, 37, 2, 401; S. L. Miller, Phys. Rev., 1955, 99, 4, 1234.

PRESENTED: At the 2nd Scientific Technical Conference for application of transistors in the construction of devices, October 1958, in Moscow, USSR

SUBMITTED: May 30, 1959

Card 16/16

24075  
S/106/61/000/002/004/006  
A055/A133

9,4300

AUTHORS:

Berg, M. A. and Garyainov, S. A.

TITLE:

Semiconductor devices with negative resistance

PERIODICAL:

Elektrosvyaz', no. 2, 1961, 31 - 41

TEXT:

After a few words on the practical application of semiconductor-devices with negative resistance, and some general information on the breakdown of semiconductors into several groups or classes and on their respective characteristics, the authors proceed to a comprehensive analysis of the process resulting in the appearance of a negative-resistance portion in the current-voltage characteristic of: 1) a p-n-p type three-electrode device having a current-voltage characteristic of the second class, and 2) a tunnel-type diode having a current-voltage characteristic of the first class. In their analysis the authors emphasize the fact that the existence of at least two sources of conductivity variation is typical for any negative-resistance device. In the second part of their article, the authors compare the current-voltage characteristics of the first and second classes, and state the observed differences. This comparative analysis shows that negative-resistance semiconductor-devices having either a first-class

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Semiconductor devices with negative resistance

or a second-class current-voltage characteristic can be used as amplifiers. An appropriate choice of the load and of the position of the quiescent point within the negative-resistance portion allows to prevent self-excitation in the absence of any signal. Considering the optimum operating value of the negative resistance, the authors state that this value is obtained when maximum negative power is released by the semiconductor-device in the negative-resistance portion of the characteristic. The feature characterizing any negative-resistance device is indeed, not the value of the negative resistance  $r(-)$ , but the negative power released in the negative-resistance portion of the current-voltage characteristic. This power must be as great as possible in any design containing negative resistances. Both classes of negative-resistance semiconductor-devices (i.e. either with first-class or second-class current-voltage characteristic) can be used in oscillating circuits as well as in amplifier circuits. The particular conditions of their use in switching circuits are discussed in the last part of the article. There are 15 figures and 14 references: 6 Soviet-bloc and 8 non-Soviet-bloc. The references to the four most recent English-language publications read as follows: Shockley. "Unique properties of the 4-layer diode". Electronic Industries & Tele-Tech, 76, no. 8, 1957. Philips, Chang. "Germanium power switching devices." IRE Transactions on Electron devices. ED-5, no. 1, 1958; Read. "A proposed high frequency

Card 2/3

Semiconductor devices with negative resistance

negative resistance diode." BSTJ, XXXVII, no. 2, 1958;  
as high frequency devices." Proc. IRE, 47, no. 7, 1959

SUBMITTED: April 27, 1960.

24075  
S/106/61/000/002/004/006  
A055/A133

Sommers. "Tunnel diodes



Card 3/3

GARYAINOV, S.A., red.; YENYUTIN, V.V., red.; LARIONOV, G.Ye., tekhn.  
red.

[Negative-resistance semiconductor devices] Poluprovodnikovye  
pribory s otritsatel'nym soprotivleniem; sbornik perevodnykh  
stat'ei. Moskva, Gos. energ. izd-vo, 1962. 238 p.

(MIRA 15:4)

(Transistors)

BERG, M.A.; GARYAINOV, S.A.

Experimental study of the switching operation in two-electrode  
p-n-p-n transistor devices with negative resistance. Radiotekhnika  
17 no.1:51-58 Ja '62. (MIRA 15:2)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva  
radiotekhniki i elektrosvyazi imeni Popova.  
(Transistors)

L 31042-65

ACCESSION NR: AP5002910

S/0109/65/010/001/0147/0156

AUTHOR: Popova, M. V.; Smolko, G. G.; Garyainov, S. A.; Stafeyev, V. I.

TITLE: Static characteristics of N-transistors

SOURCE: Radiotekhnika i elektronika, v. 10, no. 1, 1965, 147-156

TOPIC TAGS: transistor, N-transistor

ABSTRACT: A detailed exploration of the characteristics of an N-transistor (proposed by V. I. Stafeyev, et al., Rad. i elektronika, 1962, 7, 8, 1404) reveals that this device is kindred to the n-p-n-p transistor. Static input and output characteristics of N-transistors for common-base, common-emitter, and common-collector circuits are described. The input characteristics are voltage-ambiguous (S-type); the output characteristics in the common-base and common-emitter circuits are current-ambiguous (N-type); in the common-collector circuit, the characteristics are practically single-valued. Experimentally

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L 31042-65

ACCESSION NR: AP5002910

determined families of characteristics of diffusion-alloy N-transistors are presented. Orig. art. has: 8 figures.

ASSOCIATION: Fiziko-tekhnicheskly institut AN SSSR (Physico-Technical Institute, AN SSSR)

SUBMITTED: 09Sep63

ENCL: 00

SUB CODE: EG

NO REF SOV: 002

OTHER: 002

Card 2/2

L 60879-65

ACCESSION NR: AP5020126

UR/0109/65/010/008/1480/1485  
621.382.333.4

AUTHOR: Smolko, G. G.; Osipov, V. V.; Stafeyev, V. I.; Garyainov, S. A.; Popova,  
M. V. <sup>10</sup><sub>B</sub>

TITLE: N-transistors as active circuit elements

SOURCE: Radiotekhnika i elektronika, v. 10, no. 8, 1965, 1480-1485

TOPIC TAGS: N transistor, common emitter circuit, p n p n junction, p n p n transistor

ABSTRACT: A description is given of the use of N-transistors in common-emitter circuits. Applications include switching circuits, converters, pulse generators, and flip-flops. The transistor has a p-n-p-n structure between emitter and base, so that its input volt-ampere characteristics are of the S type (see Fig. 1 of the Enclosure). The low value of the switching voltage depends on the collector current and varies within 0.2-2 v. The output volt-ampere characteristic (Fig. 2) shows a sharp decrease in negative resistance with increase in bias. Voltage required for maximum current does not exceed 0.2 v; collector current can reach 30-50 mamp. Within a wide range of collector voltages, minimum collector current is in tens of microamperes. Orig. art. has: 10 figures. [DW]

Card 1/4

L 60879-65

ACCESSION NR: AP5020126

ASSOCIATION: none

SUBMITTED: 11May64

ENCL: 02

SUB CODE: EC

NO REF SOV: 002

OTHER: 000

ATT PRESS: 4063

Card 2/4



L 60879-65

ACCESSION NR: AP5020126

ENCLOSURE: 01

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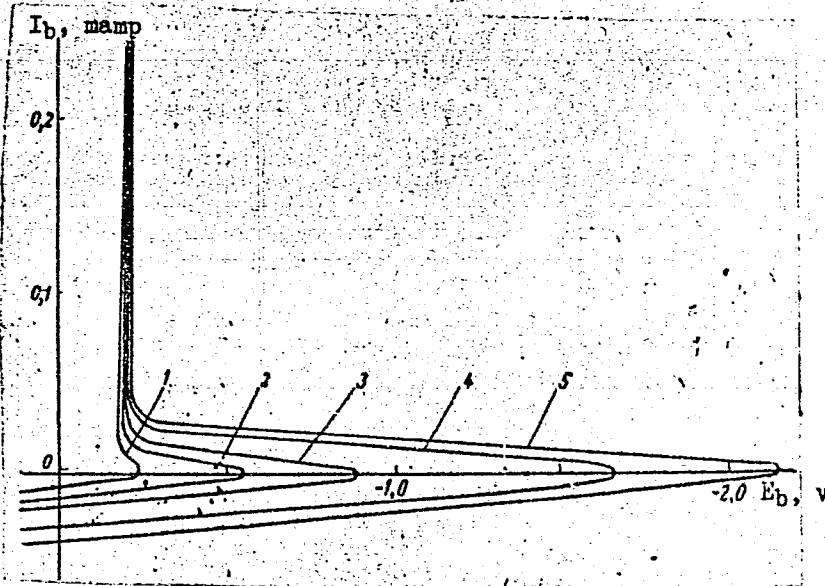


Fig. 1. Input characteristics at various collector currents ( $T = 20.5C$ )

- 1 - 0.02 mamp;
- 2 - 0.03 mamp;
- 3 - 0.05 mamp;
- 4 - 0.08 mamp;
- 5 - 0.1 mamp.

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L 60879-65

ACCESSION NR: AP5020126

ENCLOSURE: 02

0

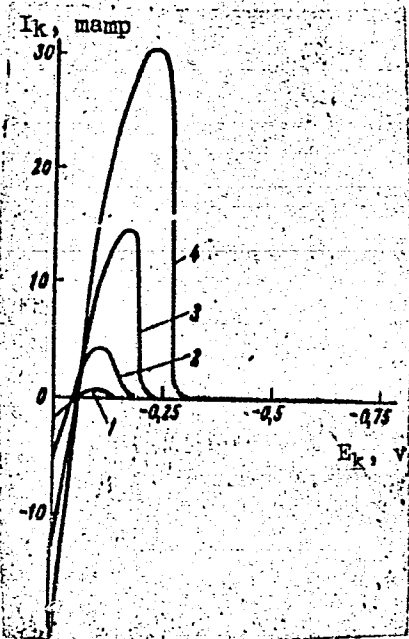


Fig. 2. Output characteristics at various base biases

- 1 - -0.25 v; 2 - -0.3 v;
- 3 - -0.35 v; 4 - -0.4 v.

Card

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2/14

L 29309-66 EWT(1)  
ACC NR: AP6012338

SOURCE CODE: UR/0108/66/021/004/0016/0024

AUTHOR: Garyainov, S. A. (Active member)

33  
B

ORG: Scientific-Technical Society of Radio Engineering and Electric Communication  
im. A. S. Popov (Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi)

TITLE: Feedback<sup>25</sup> in devices with negative resistance

SOURCE: Radiotekhnika, v. 21, no. 4, 1966, 16-24

TOPIC TAGS: negative feedback, positive feedback, pn junction, electric resistance,  
volt ampere characteristic

ABSTRACT: The author points out that circuits using semiconductor devices with one or several p-n junctions, with properties of one-port networks, cannot be analyzed by techniques applicable to two-port networks. Consequently the concept of positive and negative feedback, usually associated with two-port networks, must be revised to accommodate semiconductor devices. To this end, he analyzes the relation between positive feedback in a circuit and the volt-ampere characteristic and derives a general theorem common to all types of devices with negative resistance. The theorem states that negative-resistance devices having internal positive feedback proportional to the voltage have a static volt-ampere characteristic of class I (are voltage controlled) and have capacitive reactance in the negative-resistance sec-

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UDC: 621.375.133

L 29309-66

ACC NR: AF6012338

0

tions. Devices having internal positive current feedback have static volt-ampere characteristic of class II (are current controlled) and their reactance in the negative-resistance section is inductive. One of the possible proofs of this theorem is presented. Orig. art. has: 8 figures and 8 formulas.

SUB CODE: 09/    SUBM DATE: 20May65/    ORIG REF: 006/    OTH REF: 006

Card 2/2 BK

GARYAINOV, V. A.

USSR/ Geology - Jurassic period vertebrates

Card 1/1 Pub. 22 - 37/50

Authors : Garyainov, V. A.

Title : About the new discovery of Triassic period vertebrates

Periodical : Dok. AN SSSR 100/1, 141-142, Jan. 1, 1955

Abstract : Brief reports are presented on the finding of Triassic period vertebrates in various sections of the USSR during the year 1952-1953. Two USSR references (1936-1949).

Institution : .....

Presented by : Academician D. V. Nalivkin, October 6, 1954

GARYAINOV, V.A.

Stratigraphy of Tatarian sediments in the middle Ural Basin.  
Uch.zap.SGU 65:81-89 '59. (MIRA 16:1)  
(Ural Valley---Geology, Stratigraphic)

OCHEV, V.G.; SHISHKIN, M.A.; GARYAINOV, V.A.; TVERDOKHLEBOV, V.P.

New data on the stratigraphic division of the Triassic according to  
vertebrates in the Ural Mountain portion of Orenburg Province. Dokl.  
AN SSSR 158 no.2:363-365 S '64. (MIRA 17:10)

1. Nauchno-issledovatel'skiy institut geologii pri Saratovskom gosudar-  
stvennom universitete im. N.G.Chernyshevskogo i Paleontologicheskiy insti-  
tut AN SSSR. Predstavleno akademikom Yu.A.Orlovym.

MAVRIN, K.A.; GARYAINOV, V.A.

Basic characteristics of the tectonics of the western slope of  
the Southern Urals and the Orenburg portion of the Ural mountain  
region. Izv. vys. ucheb. zav.; geol. i razv. 7 no.6:36-42 Ja '64.  
(MIRA 18:7)

i. Saratovskiy gosudarstvennyy universitet.



GARBYAN, B. V.

GARBYAN, B. V. --"On the Role of the Nervous System in the Pathogenesis of the Rat." \*(Dissertations for Degrees in Science and Engineering Defended at USSR Higher Educational Institutions) All-Union Inst of Experimental Veterinary Science of the Min of Agriculture USSR, Moscow, 1955

SO: Knizhnaya Letopis', No. 25, 13 Jun 55

\* For Degree of Candidate in Biological Sciences

USSR / Forestry. Forest Economy

K-3

Abs Jour: Ref Zhur-Biol., No 13, 1958, 58394

Author : Akhromeyke, A.I., Gar'yanova, O.Z., Pankratova, N.M.

Inst : All-Union Scientific-Research Institute of Forestry and Mechanization of the Forest Economy

Title : The Influence of Various Doses of 2,4-D and of 2,4-D Butyl-Ether on Aspen and Birch

Orig Pub: Byul. nauchno-tekhn. inform. Vses. n.i. in-t les-ovodstva i mekhaniz. lesn. kh-va, 1957, No 4, 17-21

Abstract: The physiology department of the All Union Scientific Research Institute of Forest Mechanization conducted experiments in 1956 on the treatment of underbrush of aspen, birch, willow and other genera with preparations of 2,4-D and by 2,4-D butyl

Card 1/2

С. И. КАРЯЙЕВ, Андрей Л'вович, Л. В. СУШКИН

GARYAYEV, Andrey L'vovich; SUSHKIN, I.N., redaktor; EVENSON, I.M.,  
tekhnicheskiy redaktor.

[Preparation and repair of metal structures in metallurgical  
plants] Izgotovlenie i remont metallekonstruktsii na metallurgi-  
cheskikom zavode. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po  
chernoi i tsvetnoi metallurgii, 1957. 379 p. (MLRA 10:6)  
(Metalwork)

GARYAYEV, Andrey L'vovich; GERMAIDZE, G.Ye., retsenezent; SKOROBOGACHEVA, A.P.,  
red. izd-va; TURKINA, Ye.D., tekhn. red.

[Repairing metal parts of technical equipment in metallurgical shops]  
Remont metallokonstruktsii tekhnologicheskogo oborudovaniia metallurgi-  
cheskikh tsekhov. Sverdlovsk, Gos. nauchno-tekhn. izd-vo lit-ry po  
chernoi i tsvetnoi metallurgii Sverdlovskoe otd-nie, 1961. 38 p.  
(MIRA 14:7)

(Metallurgical plants--Equipment and supplies)

GARYAYEV A. L.

GARYAYEV, Andrey L'vovich; GERMAIDZE, G.Ye., retsenzent; SKOROBOGACHEVA, A.P.,  
red. izd-va; TURKINA, Ye.D., tekhn. red.

[Cooling equipment of open-hearth furnaces; design and manufacturing  
process] Okhlazhdaemaiia armatura martenovskikh pechei; konstruktsiia i  
tekhnologiiia izgotovleniia. Sverdlovsk, Gos. nauchno-tekhn. izd-vo  
lit-ry po chernoi i tsvetnoi metallurgii Sverdlovskoe otd-nie, 1961.  
51 p. (MIRA 14:7)

(Open-hearth furnaces—Equipment and supplies)

SHADRIH, G.A.; KASHCHENKO, F.D.; GARYAYEV, A.L.

Properties of various kinds of bronze hard facing on steel.  
Avtom. svar. 17 no.2:81-85 F '64. (MIRA 17:9)

1. Magnitogorskiy metallurgicheskiy kombinat.

SHADRIN, G.A.; KASHCHENKO, F.F.; GARYAYEV, A.L.

Manufacture of bimetal parts by means of mechanized hard facing  
of bronze on steel. Avtom. svar. 17 no.5:88-91 My '64. (MIRA 17:11)

1. Magnitogorskiy metallurgichaskiy kombinat.

L 29956-65 EWT(m)/EWP(e)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)

Pf-l JD/HM

ACCESSION NR: AP5008000

S/0125/64/000/010/0047/0052

AUTHOR: Kashchenko, F. D.; Garyayev, A. L.; Smirnov, B. I.

TITLE: New powder rod for surfacing rollers

SOURCE: Avtomaticheskaya svarka, no. 10, 1964, 47-52

TOPIC TAGS: rolling mill, powder metallurgy, powder metal, metal surfacing

Abstract: The object of this study was the development of a new grade of powder rod for surfacing rollers of hot rolling mills which would make it possible to produce a surfacing metal with more favorable operational engineering characteristics.

The work was conducted by the welding laboratory and the Central Plant Laboratory of the Magnitogorsk Metallurgical Combine. Taking part in the work were Engineers G. A. Shadrin, L. V. Simonov, G. A. Denisova and N. P. Kashirin.

Studies of the surface layer of rollers which had been surfaced with PP-3KhV28 powder rod indicated that a large quantity (50% and more) of extremely stable retained austenite is contained in this metal. Such a structure makes it impossible to fully realize the favorable effect of tungsten and chromium. Guided by these considerations and also by the

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L 29956-65

ACCESSION NR: AP5008000

research which was done, the authors developed grade MBK-61 powder rod for surfacing rollers of hot rolling mills. This rod made it possible to produce a surfacing metal with high carbon content and a relatively small amount of alloying elements. The chemical content of the metal which is deposited depends on type of flux and on surfacing conditions. Flux 48-OF-6 is the most neutral with respect to chemical action on the surfacing metal. This flux has good engineering properties, but has two disadvantages-- it quickly absorbs moisture from the air which leads to the formation of pores in the surfacing metal, and it is easily pulverized. Flux AN-20, which is widely used for surfacing, partially oxidizes the carbon, manganese and chromium, which silicon is reduced from the flux.

A comparatively hard deposit of metal is produced by surfacing with MBK-61, PP3Kh2V8 and PP-5Kh4V3F powder rods. The metal produced in surfacing with MBK-61 rod is softer and has two maximums which correspond to tempering temperatures of 350 and 500°C. This is explained by the different mechanisms of retained austenite decomposition during tempering.

Production tests of the deposited metal were carried out in the wire-strip shop of the Magnitogorsk Metallurgical Combine. The heavily loaded rollers of the second stand on the "300-2" strip mill were selected for surfacing. Surfacing was done on a roller surfacing machine with AN-20 flux, using MBK-61 powder rod with a diameter of 3.5 mm, I<sub>w</sub>--300-320

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L 29956-65

ACCESSION NR: AP5008000

amps, U--30-32 volts, V<sub>a</sub>--38 meters per hour. In order to eliminate crack formation, the rollers were preheated by induction to 420-450°C using current of industrial frequency. After surfacing, the rollers were tempered at 500-550°C. They were then pack cooled for 48 hrs to 60°C with asbestos powder. This technique made it possible to produce a surfaced metal without cracks.

Determined in tests of the surfaced rollers were: wearability (tons/mm), durability for a single installation (days), absolute wear (mm) for a single installation, type of wear and work capacity of the rollers with respect to mechanical treatment. From the characteristics of the rollers surfaced with MMK-61, PP-3Kh2V8 and PP-5Kh4V3F powder rods, it is apparent that the durability of rollers surfaced with MMK-61 powder wire is higher than that of rollers surfaced with PP-3Kh2V8 and PP-5Kh4V3F.

Orig. art. has 1 graph, 4 figures, and 2 tables.

ASSOCIATION: Magnitogorskiy metallurgicheskiy kombinat (Magnitogorsk Metallurgical Combine)

SUBMITTED: 11Dec63

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 000

JPRS

Card 3/3

GROZKHANINOV, N.Ye., kand. tekhn. nauk; GARYAYEV, A.L., inzh.; SHCHUKIN, L.I., inzh.

Submerged melt welding of the rails of crane tracks. Sver.  
proizv. no.9:35 S '65. (SIRA 18:9)

1. Ural'skiy "Promstroyniprojekt" (for Grozhaninov).
2. Magnitogorskiy metallurgicheskiy kombinat (for Garyayev).
3. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Shchukin).

KASHCHENKO, F.F.; GARYAYEV, A.L.; KOVALENKO, V.V.

Device for heating cones and bells of charging equipment. Avtom.svar.  
18 no.1:64-65 Ja '65. (MIRA 18:3)

1. Magnitogorskiy metallurgicheskiy kombinat (for Kashchenko,  
Garyayev). 2. Institut gaza AN UkrSSR (for Kovalenko).

GARYAYEV, G.R., mayor meditsinskoy sluzhby

Frequency and causes of recurrent dysentery. Voen.-med.zhur. no.8:  
63-64 '64. (MIRA 18:5)

KON'KOV, Arkadiy Sergeyevich; RAYTSES, Veniamin Borisovich; GARYAYEV,  
P.I., inzh., retsenzent; KAZAKOV, S.S., inzh., retsenzent;  
TYAGUNOV, V.A., kand.tekhn.nauk, red.; DUGINA, N.A., tekhn.red.

[Skill in forging] Masterstvo kuznetsa. Moskva, Gos.nauchno-  
tekhn.izd-vo mashinostroit.lit-ry, 1959. 350 p.

(MIRA 14:1)

(Forging)

(A) L 12117-66 EWT(m) GS

ACC NR: AT6001769

SOURCE CODE: UR/0000/65/000/000/0138/0144

AUTHOR: Avakov, A. I.; Garysynov, K. E.; Yakovlev, L. T.

ORG: None

45  
B+1

TITLE: Thermal stresses in porous concretes during hydrothermal treatment

SOURCE: AN BSSR. Institut teplo- i massoobmena. Voprosy nestatsion-  
ernogo perenosa tepla i messy (Problems of nonstationary heat and mass  
transfer). Minsk, Nauka i tekhnika, 1965, 138-144

TOPIC TAGS: thermal stress, concrete, porosity

ABSTRACT: In porous concretes (materials with a low heat conductivity), hydrothermal treatment causes significant temperature gradients which can lead to the appearance of destructive stresses. The present article describes an attempt to derive analytically calculating formulas for determination of the temperatures and the thermal stresses associated with them, since these stresses can be decisive for determination of the desired rate of temperature change. In the general case, the temperature stresses at a moment of time, tau, can be expressed by the relationship:

$$\sigma(t, \tau) = f(t_\tau - t_0).$$

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L 12117-66

ACC NR: AT6001769

For an analytical expression of the temperature stresses in terms of the values of the temperature, the time, and the flow coordinate, it is required to find:

$$\sigma = f_1(t), \quad t = \varphi(\tau, x), \quad \text{a. g.} \quad \sigma = \psi(\tau, x).$$

The article considers an infinite slab with a thickness of  $2R$ , and an initial temperature of the medium and the material,  $t_0$ ; the average temperature,  $t_{av}$ , varies according to the equation  $t_{av} = t_0 + b\tau$ , and heat transfer obeys the convection law. The initial and boundary conditions are:

$$t(x, 0) = t_0, \quad \frac{\partial t(0, \tau)}{\partial x} = 0,$$

$$-\frac{\partial t(R, \tau)}{\partial x} + H[(t_0 + b\tau) - t(R, \tau)] = 0.$$

It is required to determine  $t(x, \tau)$ , that is, to solve the equation

$$\frac{\partial t}{\partial \tau} = a \frac{\partial^2 t}{\partial x^2}.$$

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L 12117-66

ACC NR: AT6001769

The article proceeds to a mathematical development which is said to result in absolute values of the temperature stresses. Thus, during the period of heating of porous concretes, the elastic modulus and the temperature stresses are smaller than during the cooling period. During the cooling period, after the end of the chemical processes in the concrete, the elastic modulus is considerably increased and the thermal stresses are greater than during the heating period. Orig. art. has: 7 formulas and 2 figures.

SUB CODE: 11, 13/ SUBM DATE: 02Sep65/ ORIG REF: 002/ OTH REF: 001

Card 3/3

GARYAZEV, V.V.

KOZHEVIN, V.G., nachal'nik; INOZEMTSEV, P.P., nachal'nik; BELEVTSSEV, T.N., upravlyayushchiy; GARYAZEV, V.V., upravlyayushchiy; GRACHEV, L.I., upravlyayushchiy; KONOVALOV, G.I., upravlyayushchiy; GILLER, A.I., nachal'nik; GUBIN, N.I., glavnyy inzhener.

The Soviet miners honor Miners' Day with new industrial victories.

Ugol' 28 no.8:5-15 Ag '53.

(MLRA 6:7)

1. Kombinat Kuzbassugol' (for Kozhevin).
2. Kombinat Karagandaugol' (for Inozemtsev).
3. Trest Stalinugol' (for Belevtsev).
4. Trest Kalininugol' (for Gryazev).
5. Trest Molotovugol' (for Grachev).
6. Trest Shchekinugol' (for Konovalov).
7. Shakhtoupravlenie No.9/12 tresta Shchekinugol' (for Giller).
8. Shakhta No.34 tresta Krasnoarmeyskugol' (for Gubin).  
(Coal mines and mining)

GARYAZHA, V. G. (Cand. Tech. Sci.)

"Results of an Experimental Investigation of Heat Transfer during the Boiling of Masecuite,"

report presented at the Sci. and tech. session on Heat Exchange during Change of Aggregate State of Matter (by Comm on High Steam Conditions, Power Inst, AS USSR, and Inst. Thermal Engineering, AS UkrSSR) Kiev, 23-28 Sept 1957.

KTIPP

A

GARYAZHA, V. T. Cand Tech Sci -- (diss) "Study of ~~the~~ Heat  
Exchange During the ~~Boiling~~ Boiling of Second-Product ~~and~~ <sup>Sugarlost</sup>."  
Kiev, 1957. 19 pp with graphs, 22 cm. (Min of Higher Education  
Ukrainian SSR, Kiev ~~Engineering~~ <sup>Technical</sup> Inst of Food Industry im A. I.  
Mikoyan), 150 copies (KL, 25-57, 112)

GARYAZHA, V.T.

Thermal design of a vacuum apparatus for the second product.

Trudy KTIPP no.17:81-90 '57. (MIRA 13:1)

(Vacuum apparatus)

(Sugar manufacture--Equipment and supplies)

GARYAZHA, V.T.

Results of testing vacuum pans for second massocuite. Sakh.  
prom.31 no.9:15-20 S '57. (MIRA 10:12)

1. Kiyevskiy tekhnologicheskiy institut pishchevoy promyshlennosti  
imeni Mikoyana.

(Sugar machinery)

GARYAZHA, V.T.

Calculation of the coefficients of heat transmission in vacuum  
apparatus for the second product. Trudy KTIPP no.19:187-193 '58.

(MIRA 12:12)

(Sugar machinery) (Evaporating appliances) (Heat--Transmission)

GARYAZHA, V.T.

Temperature field along the section of the tube during the boiling  
of green sirup. Trudy KTIPP no.22:35-39 '60. (MIRA 14:3)  
(Sugar manufacture) (Heat—Transmission)



POPOV, V.D.; GARYAZHA, V.T.; YATSENKO, Ye.A.

Physical parameters of molasses waste. Trudy KTIPP no.22:43-47  
'60. (MIRA 14:3)

(Molasses)

TOBILEVICH, N.Yu.; SEGAN', I.I.; GARYAZHA, V.T.

Determining the heat transfer coefficients in calculation for installations use in evaporating and heating molasses waste. Izv.vys.ucheb. zav.; pishch. tekhn. no.6:112-118 61. (MIRA 15:2)

1. Kiyevskiy tekhnologicheskii institut pishchevoy promyshlennosti, kafedra teploenergetiki.

(Molasses)(Heat—Transmission)

GARYAZHA, V.T.

Lowering the intensity of heat transfer during the frothing  
of products. Sakh.prom.35 no.3:47 Mr '61. (MIRA 14:3)

1. Kiyevskiy tekhnologicheskii insitut pishchevoy promyshlennosti.  
(Evaporation) (Heat ~~Transmission~~)

TOBILEVICH, N.Yu. [Tobilevych, N.IU.]; SAGAN', I.I. [Sahan', I.I.];  
GARYAZHA, V.T. [Hariazha, V.T.]

Heat circuit for distilleries applying the steaming of molasses  
distillery wash concentrate. Khar.prom. no.4:70-73 O-D '62.  
(MIRA 16:1)  
(Distilleries—Equipment and supplies)

GARYAZHA, V.T.; SAGAN', I.I.; MATVIYENKO, B.A.; STEPCHUK, I.D.

Experimental study of heat transfer in the evaporation of  
alkali wastes. Trudy KTIPP no.25:65-68 '62. (MIRA 16:5)  
(Evaporating appliances) (Heat—Transmission)

TOBILEVICH, N.Yu.; SAGAN', I.I.; GARYAZHA, V.T.; TKACHENKO, S.I.

Heat circuit of an alcohol distillery applying the steaming of discarded molasses. Spirt.prom. 29 no.1:24-27 '63. (MIRA 16:2)

1. Kiyevskiy tekhnologicheskiy institut pishchevoy promyshlennosti imeni Mikoyana. (Distilleries—Equipment and supplies).

TOBILEVICH, N.Yu.; SAGAN', I.I.; GARYAZHA, V.T.

Studying the heat transfer in the preheaters of sugar factories.  
Sakh. prom. 37 no.10:20-26 0 '63. (MIRA 16:12)

1. Kiyevskiy tekhnologicheskij institut pishchevoy promyshlennosti.

TOBILEVICH, N. Yu.; SAGAN', I. I.; GARYAZHA, V.T.; TKACHENKO, S. I.;  
VOVCHENKO, V. S.; IVASHKEVICH, V. V.

Effect of the rate of the sugar juice motion on the thermal  
resistance of the deposits and on the heat transfer during  
heating. Izv. vys. ucheb. zav.; pishch. tekhn. no. 2:106-109 '64.  
(MIRA 17:5)

1. Kiyevskiy tekhnologicheskii institut pishchevoy promyshlen-  
nosti, kafedra promyshlennoy teploenergetiki.



ROBULEVICH, N.Y., kand. tekhn. nauk, SAGIIM, I.L. 1967. *Uchebnye zadaniya*  
GIBYASHA, V.P., kand. tekhn. nauk, SAGIIM, I.L. 1967.

Studying the effect of juice movement velocity on the  
coefficient of steam formation in heaters of steam turbines.  
Izvestiya vuzov, no. 2, 1967, p. 105.

1. Fizicheskiy tekhnik, Institut fizicheskoy matematiki  
Moskva.

ZHUCHKOVA, V.K.; SMIRNOVA, Ye.D.; GVOZDETSKIY, N.A., prof., red.;  
GARYNOV, F.I., red.; MALAKHOV, F.N., red.; CHISTYAKOVA,  
K.S., tekhn. red.

[Physical geography of the U.S.S.R.; selected lectures for  
correspondence course students attending geographical  
faculties of state universities] Fizicheskaya geografiya  
SSSR; izbrannye lektsii dlia studentov-zaochnikov geografi-  
cheskikh fakul'tetov gosudarstvennykh universitetov. Pod  
red. N.A.Gvozdetskogo. Moskva, Izd-vo Mosk. univ. No.7. [By]  
V.K.Zhuchkova, E.D.Smirnova. 1963. 69 p. (MIRA 17:3)

1. Moscow. Universitet. Nauchno-metodicheskii kabinet po za-  
ochnomu i vechernemu obucheniyu.

GAMUNIA, G. A.

"Spring Runoff of Rain Waters and Its Dependence Upon the Character of the Freezing,"  
Meteorol. i Gidrologiya, No 4, 1955, pp 31-36

The author presents the results of observations on spring rain runoff which were conducted at the Persianovsk Experimental Land Improvement Station in the course of 5 years (1949-1953). The surface runoff was computed on a portion 73.6 hectares in area and on runoff areas (in 1952) 200 and 400 m<sup>2</sup> size. The runoff of the rain waters in the mean amounted to about 65% of the total spring runoff of rain and thawed snow waters. The coefficient of runoff of rain waters has been found to vary in general directly with the depth of freezing of the soil and inversely with the thickness of the upper thaw layer of the soil. Under the thawing state of soil spring rains as a rule do not cause any surface runoff.  
(Zhurnal, No 4, 1955) SO: Sum.No. 713, 9 Nov 55

GARYUGIN, G. A.

Garyugin, G. A.

"Estuary Irrigation of Steppe Crop Plantations in the Azov Area." Min  
Higher Education USSR. Novocherkassk Soil Improvement Engineering Inst.  
Novocherkassk, 1955 (Dissertation for the degree of Candidate in Agri-  
cultural Sciences)

SO: Knizhnaya letopis' No. 27, 2 July 1955

GARYUGIN, G. A.

U S S R .

6177\* Construction of Estuary-Like Formations--An Effective Method for Checking Soil Erosion. Ustroistvo limannov-effektivnyi sposob bor'by s eroziel pochvy. (Russian.) G. A. Gariugin. *Zemledelic*, v. 3, no. 1, Jan. 1953, p. 13-16. Includes photographs.

GARYUGIN, G. A.

Subject : USSR/Meteorology AID P - 2500  
Card 1/1 Pub. 71-a - 10/26  
Author : Garyugin, G. A.  
Title : ~~Surface soil conditions and their influence on the spring runoff~~  
Periodical : Met. i Gidro., 3, 40-42, My-Je 1956  
Abstract : The dependence between the spring runoff and various crops is discussed. The author maintains that the runoff increases on extensively developed fields, whereas there is a marked decrease in the runoff for virgin soil and wastelands plowed for the first time. Two tables, 1 diagram.  
Institution: None  
Submitted : No date

GARYUGIN, G.A.

Role of the vertical taproots of fruit trees in utilizing subsoil moisture. Agrobiologiya no.2:125-127 Mr-Apr '57. (MLRA 10:5)

1. Persianovskaya opytno-meliorativnaya stantsiya, Rostovskaya oblast'.

(Fruit trees) (Roots (Botany))  
(Soil moisture)

GARYUGIN, G.A., kand.sel'skokhozyaystennykh nauk

Effect of saturation irrigation in early fall on the growth  
and fruit bearing of apple trees. Agrobiologiya no.2:292-293  
Mr-Ap '62. (MIRA 15:4)

1. Stavropol'skaya opytno-maliiorativnaya stantsiya.  
(Caucasus, Northern--Apple--Water requirements)



GARYGIN, G.A., kand. sel'skokhoz. nauk

Winter wheat in irrigated soils. Zhurnal 26 no.9:48-51 S 16a,  
(S.S. 17-17)

1. Stavropol'skaya opytno-meliorativnaya stantsiya.

GARYUSHKIN, S., ryadovoy

Follow-up of our articles. Komm. Vooruzh. Sil 5 no.22:96 N '64.  
(MIRA 17:12)

MAKIYENKO, Nikolay Ivanovich; OBLIVIN, N.N., nauchnyy red.; GARYUNOVA,  
L.K., red.; TOKER, A.M., tekhn. red.

[Bench work]Slesarnoe delo. 2., perer. i dop. izd. Moskva,  
Proftekhizdat, 1962. 381 p. (MIRA 16:2)  
(Machine-shop practice)

GARZANO

G.K.

Distr: 483d

Lubricating oil additive: V. V. Gal'chenko, A. M. Ravi-  
kovich, G. B. Garzanov, G. G. Vinner, E. L. Al'perovich,  
and L. A. Bondarchuk. U.S.S.R. 107,613, Sept. 25, 1957.  
Additive BZ-3 (3%) and 1% hexachloroethane are added  
to mineral lubricating oil. M. Hosh

ymb 1/1 8

5.1110

77541

SOV/65-60-2-1/15

AUTHORS:

Ayzenshtayn, P. G., Velikovskaya, Ye. M., Garzanov, G. Ye., Crushevenko, V. I., Sterkhova, L. N.

TITLE:

Anastas'yevsk Crude Oil From Bed IV as a Raw Material for Low-Viscosity Oils

PERIODICAL:

Khimiya i tekhnologiya topliv i masel, 1960, Nr 2, pp 1-6 (USSR)

ABSTRACT:

Of the three oil-producing beds IV, V, VI of the Anastas'yevsk deposit, Krasnodar Region, only the first yields crude oil suitable for production of special oils. The bed is capable of supplying the Soviet economy with all the needed types of low solid point special oils. The solidification point of the crude oil is  $-60^{\circ}\text{C}$  and that of the machine distillate is  $-20^{\circ}\text{C}$ . Crude oils from the other two beds require desparaffinization if special oils are to be produced. According to the data of Yaroslavl and Gorki refineries, crude oil from bed IV contains 51.6% methane-naphthenes, 7.6% light-, 26.0% intermediate-, and

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3

Anastas'yevsk Crude Oil From Bed IV as a  
Raw Material for Low-Viscosity Oils

77541  
SOV/65-60-2-1/15

13.4% heavy aromatic compounds and tars, less than 0.2% paraffin, and less than 0.1% S; the tar content reaches 35 to 40% after extraction of bright stock up to 300° C. All types of special oils can be produced from this crude oil, which contains up to 80% fuel and lube low-solid point distillates. Using the same methods as applied to Baku oils, the two refineries produced 14 different products whose solid points ranged from -12 to -70° C. Additional purification was necessary only in a few cases. The purified products were better than those from the Baku and Emba crude oils. For instance, transformer oils could be obtained from the Anastas'yevsk oils that did not require antioxidant and antidepressing additives. However, the transformer oil was of lower quality than imported oils. To achieve the latter's quality, the Yaroslavl refinery purified the distillate with SO<sub>3</sub> gas and added 0.2% ionol or 0.1% VTI-1, another antioxidant, to the product.

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Anastas'yevsk Crude Oil From Bed IV as a  
Raw Material for Low-Viscosity Oils

77541  
SOV/65 60-2-1/15

The obtained oil was colorless, highly stable, and had mp  $-56^{\circ}$  C. The Gor'ki refinery obtained transformer oil of the same high quality (mp below  $-50^{\circ}$  C) by purifying the distillate with 99%  $H_2SO_4$ , also adding 0.2% ionol. Both  $SO_3$  and  $H_2SO_4$  alter the proportion of hydrocarbons; i.e., they almost double the methane & naphthene contents at the expense of aromatic compounds and tars. Special oils MK-8, MVP, AU, and SU can also be produced from Anastas'yevsk crude oils. The first was of higher quality than specifications require, but the latter two brands had flash points below permitted values. The residue after the extraction of special oils can be utilized for production of other oils and bitumen. I. Zinchenko, N. Zolotareva, and O. Morozova of the Gor'ki plant and G. Vozonova, A. Mel'nikova, and O. Klochkova of the Yaroslavl' plant took part in the work. There are 3 tables.

ASSOCIATION:  
Card 3/3

Petroleum-Lubricant Refineries (Nefteemaslozavody)

GARZANOV, G.Ye.

"Production of lubricating oils" by A.E.Al'tshuler, P.I.Korotkov,  
V.L.Kazanskii, N.M.Gerasimenko. Reviewed by G.E.Garzanov. Khim.  
i tekhn. i masel 5 no.7:68-69 JI '60. (MIRA 13:7)

(Lubrication and lubricants)

(Al'tshuler, A.E.)

(Korotkov, P.I.)

(Kazanskii, V.L.)

(Gerasimenko, N.M.)



GARZANOV, G.Ye.

Closing word. Proizv. smaz. mat. no.6/8:188-191 '61. (MIRA 14:8)

1. Trest opytno-promyshlennogo proizvodstva "Neftemaslozavody".  
(Lubrication and lubricants)

S/137/62/000/010/006/028  
A052/A101

AUTHORS: Afanas'yev, I. D., Dobkin, I. Ye., Sazanova, M. N., Soltan, S. G.,  
Garzanov, G. Ye., Tokar', I. K., Chamin, I. A., Belosevich, V. K.,  
Pavlov, I. M.

TITLE: The effect of substances with a lower surface tension in the  
composition of synthetic lubricants on the cold rolling of  
thin metal strips

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 10, 1962, 8,  
abstract 10D46 ("Novosti neft. i gaz. tekhn. Neftepererabotka i  
neftekhimiya", no. 4, 1962, 23 - 27)

TEXT: The data on the effect of various technological lubricants on the  
cold rolling of strips on a two- and four-high mill are cited. Synthetic greases,  
- esters of saturated synthetic fatty acids, - reduce the friction and the re-  
sistance of metal to deformation at rolling of carbon steel and Ti (BT-1-T)  
(VT-1-T) strips more effectively than animal fat, palm oil, mineral oils etc.  
Synthetic lubricants, due to their low costs and good lubricating quality, should

Card 1/2

S/137/62/000/010/006/028

The effect of substances with a lower surface tension..A052/A101

be recommended for an extensive testing on cold rolling mills.

N. Yudina

[Abstracter's note: Complete translation]

Card 2/2

L 1349-66 EWT(m)/EPF(c)/T : DJ

ACCESSION NR: AP5024387

UR/0286/65/000/015/0068/0068  
665.521.5

AUTHOR: <sup>44</sup> Bulantseva, T. P.; <sup>44</sup> Garzanov, G. Ye.; <sup>44</sup> Gorbunova, A. A. 24  
B

TITLE: A gasoline-resistant grease.<sup>44</sup> Class 23, No. 173367

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 15, 1965, 68

TOPIC TAGS: grease, gasoline resistant grease, lubricant

ABSTRACT: This Author's Certificate introduces: 1. A gasoline-resistant grease which contains ethylcarbitol, montan wax and caustic soda to increase its resistance to hydrocarbon vapors. 2. A modification of this grease which contains ethylcarbitol and montan wax in a 1:1 ratio.

ASSOCIATION: none

SUBMITTED: 29Nov63

ENCL: 00

SUB CODE: FP

NO REF SOV: 000

OTHER: 000

<sup>KE</sup>  
Card 1/1

L 00740-66 EWT(m)/EPT(c)/T BW/DJ

ACCESSION NR: AP5021990

UR/0286/65/000/014/0065/0065  
665.4/.5

AUTHOR: <sup>44</sup>Garzanov, G. Ye.; <sup>44</sup>Vinner, G. G.; <sup>44</sup>Maloletkov, Ye. K.; <sup>44</sup>Bogdanov, Sh. K.; <sup>43</sup>  
<sup>44</sup>Sergiyenko, V. G.; <sup>44</sup>Petyakina, Ye. I.; <sup>44</sup>Selivanchik, Ya. V.; <sup>44</sup>Vertlib, Ya. Ye.; <sup>44</sup>  
<sup>44</sup>Gusman, M. Ye.; <sup>44</sup>Shames, F. Ya.; <sup>44</sup>Smirnov, M. I.; <sup>44</sup>Granat, A. M.; <sup>44</sup>Bulantseva, T. P.;  
<sup>44</sup>Krylova, T. A. <sup>44</sup>

TITLE: A method for producing hydraulic fluid. Class 23, No. 172947

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 65

TOPIC TAGS: hydraulic fluid, petroleum product

ABSTRACT: This Author's Certificate introduces a method for producing hydraulic fluid based on petroleum products. The efficiency of the fluid at low temperatures is improved by using a velosite distillate with a flash point of 115-120°C and a viscosity of less than 2200 centistokes at -40°C.

ASSOCIATION: Nauchno-issledovatel'skiy institut organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi (Scientific Research Institute for Organization, Mechanization and Technical Assistance)

Card 1/2

L 00740-66

ACCESSION NR: AP5021990

SUBMITTED: 14Aug64

ENCL: 00

SUB CODE: FP

NO REF SOV: 000

OTHER: 000

*OP*  
Card 2/2

L 14574-66 ENT(m)/f DJ

ACC NR: AP6005336

SOURCE CODE: UR/0413/66/000/001/0074/0074 4/1

INVENTOR: Papok, K. K.; Kreyn, S. E.; Vipper, A. B.; Zuseva, B. S.; Garzanov, G. Ye.  
Vinner, G. G.; Dobkin, I. Ye.; Afanas'yev, I. D.; Rogachevskaya, T. A.; Somov, V. A.;  
Botkin, P. P.; Kuliyeu, A. M.; Zaynalova, G. A.

ORG: none

TITLE: Preparation of motor oil. Class 23, No. 177579

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 1, 1966, 74

TOPIC TAGS: motor oil, antiwear additive, detergent additive

ABSTRACT: An Author Certificate has been issued for a preparative method for motor oil, involving addition of a detergent and an antiwear additive to the oil base. The method provides for the use of an alkyl-formaldehyde condensation product and of a dialkyl dithiophosphate based on C<sub>12</sub>-C<sub>16</sub> alcohols as the additives. [B0]

SUB CODE: 11/ SUBM DATE: 16Apr64/ ATD PRESS: 4/90

Card <sup>FW</sup> 1/1

UDC: 621.892.8 2

L 25E30-66 EWT(m)/EWP(w)/T/EWP(t) JD/DJ

ACC NR: AP6015646

(A)

SOURCE CODE: UR/0413/66/000/009/0055/0055

INVENTOR: Ravikovich, A. M.; Zolotova, I. D.; Garzanov, G. Ye.; Vinner, G. G.; Petyakina, Ye. I.; Obleukhova, O. S.; Borshchevskiy, S. B.; Bagryantseva, P. P.

11/3

ORG: none

TITLE: Preparative method for antiwear additives. Class 23, No. 181223

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 9, 1966, 55

TOPIC TAGS: antiwear additive, monoolefin polymer, sulfurization

ABSTRACT: An Author Certificate has been issued for a preparative method of antiwear additives by sulfurization of monoolefin polymers at 140-180C. [B0]

SUB CODE: 11/ SUBM DATE: 16Jul64/ ATD PRESS: 4255

Card 1/1

2



L 01805-67 ENT(m)/T DJ

ACC NR: AP6030592 (AN) SOURCE CODE: UR/0413/66/000/016/0074/0074

61  
60  
3

INVENTOR: Garzanov, G. Ye.; Petyakina, Ye. I.; Bagryantseva, P. P.;  
Shames, F. Ya.; Ravikovich, A. M.; Boshchevskiy, S. B.; Maloletkov, Ye. K.;  
Selivanchik, Ya. V.; Gusman, M. Ye.; Skvirskiy, P. A.; Aver'yanov, V. A.;  
Uzunkoyan, P. N.; Pisarchik, A. N.; Mikhaylov, Yu. A.; Belogradskiy, A. P.;  
Bayevskiy, F. S.; Fomin, N. I.

ORG: none

2  
||

TITLE: Method of obtaining a hydraulic lubricant. Class 23, No. 185000.  
[Announced by the Scientific Research Institute for Organization, Mechanization,  
and Technical Assistance to Construction (Nauchno-issledovatel'skiy institut  
organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966,  
74

TOPIC TAGS: lubricant, lubricant additive, antioxidant additive, polymethacrylate,  
hydraulic lubricant

ABSTRACT: An Author Certificate has been issued for a method of obtaining a  
hydraulic lubricant by means of additives with an oil base. To expand the operat-  
Card 1/2 UDC: 621.892.8:621.226

L 01805-67

ACC NR: AP6030592

ing temperature range of oil mixture of mineral oil residue are  
taken as the oil base to which a multifunctional additive is added, such as EFO, an  
antioxidant agent such as octadecylamine, and a depressing agent, such as a  
polymethacrylate. [Translation] [NT]

SUB CODE: 11/ SUBM DATE: 25May65/.

*lsh*

SUZDAIEV, I.F.; MAKAROV, Ye.F.; GARZANOV, I. Ya.; FORYTKO, I.I.

Oxidation of finely dispersed tin studied by means of Mössbauer effect. *Kin. i kat.* 6 no. 6:1108-1111 N-D '65 (MIRA 19:1)

1. Institut khimicheskoy fiziki AN SSSR. Submitted March 9, 1965.

GARZC, Gabriella (Mrs) (Budapest, VIII., Museum Korut 6-8); SZABO, Tamas (Budapest, VIII., Museum Korut 6-8)

Examinations of thermal processes in nitrid silicon organic polymers by means of microreactor-gas chromatography. *Acta chimica Hung* 41 no.3:269-280 1964.

1. Lehrstuhl für Allgemeine und Anorganische Chemie der Lorand Eotvos Universität, Budapest, und Forschungsgruppe für Anorganische Chemie der Ungarischen Akademie der Wissenschaften, Budapest.

L 10873-66 EWT(m)/EWP(j)/I/ETC(m) RPT. WH/RM

ACC NR: AP5025864

SOURCE CODE: UR/0020/65/164/004/0822/0825 57

AUTHOR: Nefedov, O. M.; Garzo, G.; Sekey, T.; Shirayev, V. I. 44.55 44.55 44.55 78

ORG: Institute of Organic Chemistry im. N. D. Zelinskiy (Institut organicheskoy khimii); Inorganic Chemistry Research Group, Academy of Sciences, VNR, Budapest (Issledovatel'skaya gruppa po neorganicheskoy khimii Akademii nauk VNR)

TITLE: Structure and thermal degradation of cyclic and linear polymers of dimethylsilylene and dimethylgermylene

SOURCE: AN SSSR. Doklady, v. 164, no. 4, 1965, 822-825

TOPIC TAGS: organosilicon compound, organogermanium compound, pyrolysis

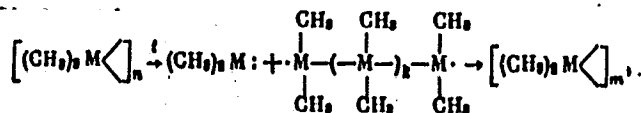
ABSTRACT: An IR, NMR, and mass-spectrometric study of the soluble part of the products resulting from the reaction of  $(\text{CH}_3)_2\text{SiCl}_2$  with lithium in tetrahydrofuran showed that it consists mainly (95-97%) of crystals melting at 228-231C and forming the cyclic polymer  $[(\text{CH}_3)_2\text{Si}]_n$ . Similarly, a mass-spectrometric analysis confirmed that the germanium polymer, melting at 207-209C, also forms the cyclohexamer  $[(\text{CH}_3)_2\text{Ge}]_6$ . Pyrolysis of dimethylsilylene and dimethylgermylene at moderate temperatures (up to 350-400C) leads mainly to the rupture of M-M bonds to the formation of monomeric, dimeric, and polymeric biradicals:

Card 1/2

L 10873-66

ACC NR: AP5025364

9



where M = Si or Ge; k = 0-4 or more; m=3(?), 4-6 and more. In the absence of special acceptors, these biradicals recombine chiefly with one another, forming the cyclic polymers  $[(CH_3)_2 M \langle \rangle_m]$ . The data obtained indicate that pyrolysis of the polymers  $[(CH_3)_2 M \langle \rangle_n]$ , where M = Si, Ge, Sn, or Pb, can be used as a general method of generating the corresponding carbenoids  $(CH_3)_2 M$ . The paper was presented by B. A. Kazanskiy, Member of AN SSSR, 26 Mar 65. Authors thank M. I. Gorfinkel, A. S. Khachaturov, and L. A. Leytes for carrying out the spectroscopic determinations.

Orig. art. has: 2 tables.

SUB CODE: 07 / SUBM DATE: 11Mar65 / ORIG REF: 004 / OTH REF: 007

OC  
Card 2/2

L 46224-66 EWP(j) AT/RM

ACC NR: AT6034084

SOURCE CODE: HU/2502/65/045/004/0301/0311

AUTHOR: Fritz, Denes--Fritts, D.; Garzo, Gabriella; Szekely, Tamas--Sekei, T.; Till, Ferenc 33  
BT1

ORG: Department of General and Inorganic Chemistry, L. Eotvos University, Budapest; Research Group for Inorganic Chemistry, Hungarian Academy of Sciences, Budapest

TITLE: Anomalous response of the flame ionization detector to organosilicon compounds 7

SOURCE: Academia scientiarum hungaricae. Acta chimica, v. 45, no. 4, 1965, 301-311

TOPIC TAGS: organosilicon compound, gas chromatography, chemical laboratory apparatus

ABSTRACT: An inversion of the gas chromatographic peaks of organosilicon compounds can be observed when detection is done by flame ionization detector. This effect also appears under conditions where a hydrocarbon gives normal and well-evaluable peaks. The following factors have been studied concerning their influence of the peak inversion: flow rates of the fuel and scavenging gases, the chemical nature of the sample, and the voltage of the detector. The inverted peaks permit the gas-chromatographic estimation of the characteristic C/Si ratio of an unknown organosilicon compound. A flame ionization detector operating with a mixed hydrogen-hydrocarbon flame detects organosilicon compounds as negative peaks. On this basis, such detectors are recommended for use in the qualitative analysis of organosilicon compounds. Orig. art. has: 6 figures and 4 tables. [Orig. art. in Eng.] [JPLS: 33,906]

SUB CODE: 07 / SUBM DATE: 15Dec64 / OTH REF: 007

Card 1/1 mjs

PEL'DSEYIN, A.I.; GARZANOVA, G.V.

Variability of Gärtner's bacillus; author's abstract. Zhur.  
mikrobiol.epid. i immun. 28 no.5:95-96 My '57. (MIRA 10:7)

1. Iz bakteriologicheskoy laboratorii Saratovskoy sanitarno-  
epidemiologicheskoy stantsii Stalinskogo rayona.  
(SALMONELLA ENTERITIDIS)

GARZICIC, B.; ANAF, M.

Differentiation of white rat embryonic thyroid in vitro on a medium without pituitary hormones. Acta med. iugosl. 13 no.4: 409-423 '59.

1. Onkoloski institut i Bioloski institut Medicinskog fakulteta u Beogradu.

(THYROID GLAND embryol.)



GARZICIC, B.; ZIVKOVIC, S.

Changes in some aspects of cells inoculated into experimental animals and returned to in vitro conditions. Acta med. Iugosl. 19 no.1:15-28 '65.

GARZO, Bela, okleveles kohászati

Guidelines for designing automated bath foundries. Hon lap 97 no.12:  
Suppl;Ontode 15 no.12:277-283 D 164.

1. Designing Offices, Ministry of Metallurgy and Machine Industry,  
Budapest.

LENGYEL, Bela, prof., dr. (Budapest, VIII., Muzeum korut 6-8);  
GARZO, Gabriella (Mrs) (Budapest, VIII., Muzeum korut 6-8);  
SZEKELY, Tamas (Budapest, VIII., Muzeum korut 6-8)

On some problems concerning the gas chromatographic analysis  
of methylchlorosilanes. Acta chimica Hung 37 no.1:37-51 '63.

1. Institute of General and Inorganic Chemistry, Lorand Eotvos  
University, Budapest. 2. Editorial board member, "Acta Chimica  
Academiae Scientiarum Hungaricae" (for Lengyel).

CSAKVARI, Bela (Budapest, VIII., Muzeum korut 6-8); GARZO, Gabriella (Budapest, VIII., Muzeum korut 6-8); JENEI, Sandor (Budapest, VIII., Muzeum korut 6-8).

On the direct synthesis of methyl chloro silanes. Pt.2.  
Acta chimica Hung 39 no.1:33-37 '63.

1. Institute of General and Inorganic Chemistry, L. Eotvos University, Budapest; Research Group for Inorganic Chemistry of the Academy of Sciences, Budapest.