"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.A., inzh. (Minsk)

Laying reinforced concrete ties on track circuit territory.
Put' i put.khoz.5 no.2:22-23 F '61. (MIRA 14:3)
(Railroads—Track)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.A., inzh. (g.Minsk); LIPSKIY, M.V., dotsent (g.Minsk)

Maintenance of a continous track in the plane. Put'i put.khoz. 5 no.5:16-17 My '61. (MIRA 14:6)

(Railroads--Track)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

YEREMKIN, S.Ya. (st. Borisov, Belorusskoy dorogi); AFANAS'YEV, S.A., inzh (st. Borisov, Belorusskoy dorogi)

Machine for tie bandaging. Put' i put.khoz. 6 no.5:42-43 '62. (MIRA 15:4)

1. Glavnyy inzhener Borisovskogo shpalopropitochnogo zavoda.
(Railroads—Equipment and supplies) (Railroads—Ties)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

CHERTOV, N.G.; AFANAS'YEV, S.A., inzh.

Continuous rail track on wooden ties. Put' i put.khoz. 6 no.3:12 Mr '62. (MIRA 15:3)

1. Nachal'nik Borisovskoy distantsii Belorusskoy dorogi.
(Railroads--Track)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.A.; VASIL'YEV, S.V. (g.Cheboksary)

Electrolytic production of the metallic calcium from fused nitrates. Khim. v shkole 13 no.4:29-30 Jl-Ag '58. (MIRA 11:6)
(Calcium)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

ZHIGALIN, V.F.; AFANAS'YEV, S.A.; GERASIMOV, K.M.

Everything for man. Zdorov'e 6 no.6:1-3 Je '60. (MIRA 13:7)

1. Predsedatel' Moskovskogo gorodskogo Soveta narodnogo khozyaystva (for Zhigalin). 2. Predsedatel' Leningradskogo Soveta narodnogo khozyaystva (for Afanas'yev). 3. Predsedatel' Gor'kovskogo Soveta narodnogo khozyaystva (for Gerasimov).
(LENINGRAD PROVINCE--MEDICAL SUPPLIES)
(INDUSTRIAL HYGIENE)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

BUTOMA, B.Ye.; YEGOROV, M.Ye.; DEREVYANKO, Yu.G.; KHABAKHPASHEV, A.A.; BAKAYEV, V.G.; ISHKOV, A.A.; KOLESNICHENKO, N.S.; KAMENTSEV, V.M.; GORSHKOV, S.G.; KASATONOV, M.A.; ISHCHENKOV, N.V.; AFANAS'YEV, S.A.; TITOV, G.A.; LARIONOV, M.F.

Boris Evgen'evich Klopotov; obituary. Sudostroenie 30 no.11:81 '64. (MIRA 18:3)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.D.

"Developement of Maumatism in a Folded Region with Special References to the North Caucasus."

At the VII Pakistan Science Conference held in Bahawalpur 21-26 Jan 1955, the Soviet delegate S.D. AFANAS'YEV delivered a highly technical paper on "Developement of Maumatism in a Folded Region with Special Reference to the North Caucasus,".

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

STARIK, I.Ye., otv.red.; SHCHERBAKOV, D.I., akademik, zamestitel' otv.red.; BARANOV, V.I., prof., zamestitel' otv.red.; SHATSKIY, N.S., akademik, red.; POLKANOV, A.A., akademik, red.; VINOGRADOV, A.P., akademik, red.; AFANAS'YEV, S.D., red.; GERLING, E.K., prof., red.; PEKARSKAYA, T.B., kand.geologo-mineral.nauk, red.; IVANOV, B.V., red.izd-va [deceased]; GUSEVA, A.P., tekhn.red.

[Transactions of the sixth session of the Committee on the Determination of the Absolute Chronology of Geological Formations, May 22-27, 1957] Trudy shestoi sessii komissii po opredeleniiu absoliutnogo vozrasta geologicheskikh formatsii; 22-27 maia 1957 g. Moskva, 1960. 306 p. (MIRA 13:7)

1. Akademiya nauk SSSR. Komissiya po opredeliniyu absolyutnogo vozrasta geologicheskikh formatsiy.
(Geological time)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.F.

14

The use of the distillate from coke ovens against mosquito larvae. S. F. Afanas'ev. *Med. Parasitol.* (U. S. S. R.) 10, 287-90(1941); *Rev. Applied Entomol.* 31B, 59-60 (1943). Good control of anopheline mosquito larvae was obtained by a distillate of d₄ 0.925, flash point not over 35°, b. 138°, Engler viscosity 1.00 at 50°.

Edwin J. Seifert

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.F.

Ca

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PROCESSES AND PROPERTIES INDEX

Employment of the distillate of coke filters for the destruction of the larvae of Anopheles maculipennis. Preliminary communication S. F. Afanas'ev. *Med. Parasit. & Parasitic Diseases* (U. S. S. R.) 7, 694-700(1938); *U. S. Pub. Health Eng. Abstracts* 20, Ma, 16 Feb., 1940).

The author employed the distillate of coke filters obtained in the final stages of fractional distn. of Russian petroleum. The distillate is composed of heavy oils, including solar oil, and represents a mixt. of hydrocarbons, mainly aromatic compds. In a lab. expt. the distillate was sprayed over the surface of the water in a vessel contg. 60 larvae of *A. maculipennis*. All were killed within 60 min. When applied to natural reservoirs contg. mosquito larvae the distillate caused the destruction of all the larvae and other aquatic animals except Crustacea and *Gambusia*, in 24 hrs. Conclusion: The distillate provides a satisfactory substitute for petroleum and can be used for oiling in the same doses, i. e., about 25-50 g. per sq. m., according to the amt. of vegetation present. C. R. Fellers

A58-15A METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

RAK, A.S.; AFANAS'YEV, S.F.

Flight of grey cranes. Priroda 45 no.9:126 S '56. (MLRA 9:10)

1.Groznenskiy oblastnoy otdel okhotnich'yego khozyaystva (for Rak).
2.Groznenskiy oblastnoy muzey krayevedeniya (for Afanas'yev).
(Cranes (Birds))

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

LYLOV,D.V.; SUSLENNIKOV, V.V.; ZAVOVIT, A.V.; Prinimali uchastiye: IVASHIN, N.A.; PIGOLEV, S.V.; AFANAS'YEV, S.G.; TROITSKIY, P.S., red.; ZAMYSHLYAYEVA, I.M., red.izd-va; SALAZKOV, N.P., tekhn. red.

[Special purpose motor vehicles for fire prevention] Avtomobili spetsial'nykh sluzhb pozharnoi okhrany. Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1960. 274 p. (MIRA 16:10)
(Motor vehicles)
(Fire departments--Equipment and supplies)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.

Cr

Sulfur in Bessemer steels. S. G. AFANAS'EV. *Domes* 1932, No. 7, 28-32.
Analyses of iron samples taken while the metal was poured from the blast furnace into the ladles, and from the ladles into the mixer, showed some loss of S, up to 27% during the transport of the molten metal. In the mixer, the S increases again, because of the acid lining of the mixer. To avoid this, it is recommended to use a magnesite instead of a siliceous lining.

S. L. MADORSKY

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

AFANAS'YEV, S. G.

PROCESSES AND PROPERTIES INDEX

S

9

Experience in the Production of Free-Cutting Steels. S. Afanas'ev. (Stal, 1940, No. 10, pp. 24–25). (In Russian). Bessemer steels with carbon 0·08–0·15%, manganese 0·60–0·90%, silicon 0·15–0·30%, sulphur 0·075–0·15% and phosphorus 0·080–0·150% were produced. After some preliminary tests it was found advantageous to use low-carbon silico-manganese for preliminary and final deoxidation of the metal. Phosphorus was added as 27% ferro-phosphorus. Sulphur was added in the ladle while pouring the metal from the converter. Loss of sulphur amounted to 35–45%. The tendency of the corners of the ingots and blooms to develop cracks was eliminated by pouring the metal into hot-top, wide-end-up moulds. Metal should be poured from the converter at 1520–1500° C. and poured into the moulds at 1440–1460° C. Hairline cracks in blooms could be reduced by increasing the amount of aluminium added in the ladle, or completely eliminated by bottom-pouring. The mechanical properties of the steels are reported.

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AFANAS'YEV, S.G.

C

7

Production and service of chrome-magnesite crown brick. S. G. Afanas'ev. *Ogneupory*, 15 [7] 316-25 (1950).—The mix was made of chromite 50, sintered magnesite 25, and chrome magnesite scrap 25%. The chromite was 20 to 38% Cr_2O_3; the brick analyzed 17 to 26% Cr_2O_3 and not less than 35% MgO. Destruction in an open-hearth crown proceeds in two stages and is caused by the solution of iron oxides in chromite grains and the formation of magnesioferrite in the bond between the grains. In the first stage, the oxides of Fe, Si, and Mn are absorbed by the relatively cold surface of the crown during charging and the first period of melting. As the temperature of the crown rises, the second stage develops; this is characterized by the solution of iron oxides (previously absorbed by the brick) in the chromite grains, swelling of the grains, and formation of magnesioferrite in the bond between the grains. The formation of magnesioferrite may precede the solution of the oxides in the grains. The results of these processes are as follows: (1) The melt, which was adsorbed from the furnace space and permeates the capillaries of the brick, changes in composition (becomes devoid of iron oxides). As the crown gets hotter, the melt, which now consists chiefly of CaO and SiO_2, migrates into the interior of the brick. (2) Swelling of the chromite grains produces stretching stresses

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in the zone of transformation of the grains. (3) The formation of the magnesioferrite permits the chromite grains to expand within certain limits, to force magnesioferrite out of the intergrain spaces, and to shift with respect to one another under the influence of contracting stresses. In the outer (hot) zone, this process causes individual grains or groups of grains to break away (first stage). In deeper zones, the shifting of the grains does not disturb the monolithic structure of the brick, and the main direction of the shifting is toward the outer surface from which the grains broke away. The plastic deformation extends to the zone of sintering where CaO and SiO_2 predominate in the capillaries; in this zone, there is little or no swelling of the chromite grains or magnesioferrite formation, and the coefficient of linear expansion is very small. Plastic deformation, in this zone, is less probable and the contracting stresses are much smaller or even completely absent. Under these conditions, the zone which is saturated with iron oxides cannot, in its attempts to expand, entrap particles from the zone of sintering. This zone will separate from the brick as layers of plastically deformed pieces (second stage). The thermal stability of the brick in the ordinary meaning does not play an important role in the destruction of the crown. Of very great importance are the melting temperatures of the CaO and SiO_2 melt which fills the capillaries of the brick above the zone of destruction (new horizon of migration) and the conditions which create this temperature on the cold surface of the brick. If the cold surface of the brick has a temperature equal or close to the melting temperature of the CaO and SiO_2 melt, then all its capillaries will be filled with the melt and this will limit the zone of destruction only to the fire surface of the crown.

B.Z.K.

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AFANAS'YEV, S. G.

Jun 51

USSR/Engineering - Refractories

"Increasing the Durability of Tuyeres in a Bessemer Converter," S. G. Afanas'yev, S. B. Gol'bets, Engineers, Dnepropetrovsk Metallurgical Plant imeni Petrovskiy

"Ogneupory" No 6, pp 260-266

Tests showed durability of chromite and high-alumina tuyeres, nearly similar, is almost twice that of ordinary chamotte tuyeres now made at plant. Bottom-lining material is important to durability of tuyeres, and improvement in quality of Dinas bricks, used for lining, appears major factor in longer tuyere life.

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S. G.

"Effect of Wear of Bottoms and Tuyeres upon the Technological Conditions of Bessemer Process." Min Higher Education USSR, Dnepropetrovsk Order of Labor Red Banner Metallurgy Inst imeni I. V. Stalin, Dnepropetrovsk, 1955. (Dissertation for the Degree of Candidate of Technical Sciences)

SO: M-972, 20 Feb 56

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G., inzhener.

The hundredth anniversary of the Bessemer process. Stal' 15 no.10:949-951 O '55. (MIRA 9:1)

1.TSentral'nyy nauchno-issledovatel'skiy institut khlopchato-bumazhnoy promyshlennosti.
(Bessemer process)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

The effect of [illegible]

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

Pneumatic methods for [illegible] with pure oxygen. S. G. Alanas'ev, M. M. [illegible] and [illegible] Andreev [illegible]

[illegible] pressure [illegible]

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

(Bessemer Process) (UNCLASSIFIED)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.

Metallurgy in Belgium, Luxembourg and France. Metallurg no.8:36-40 Ag '56. (MIRA 9:10)

1.Nachal'nik laboratorii TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Europe, Western--Metallurgy)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

MOZGOVOY, N.I., inzhener; AFANAS'YEV, S.G., inzhener; SHUMOV, M.M., inzhener; EPSHTEYN, Z.D., inzhener; ANDREYEV, T.V., inzhener.

Developing an oxygen-using converter process for open-hearth cast iron. Sbor.trud.TSNIICHM no.13:229-299 '56. (MLRA 9:11)
(Cast iron--Metallurgy)
(Oxygen--Industrial applications)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, Sergey Gavrilovich; POPOVKO, V.K., redaktor; ROZENTSVEYG, Ya.D., redaktor izdatel'stva; EVERSON, L.M., tekhnicheskiy redaktor

[Studies in the Bessemer process] Issledovanie bessemerovskogo protsessa. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 109 p. (MIRA 10:3)
(Bessemer process)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

SOV/137-58-11-22096

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 38 (USSR)

AUTHOR: Afanas'yev, S. G.

TITLE: Oxygen Conversion of Open-hearth Pig Iron Converters (Peredel martenovskogo chuguna v konverterakh s primeneniyem kisloroda)

PERIODICAL: V sb.: Primeneniye kisloroda v metallurgii. Moscow, Metallurgizdat, 1957, pp 31-39

ABSTRACT: The results of an investigation of technically pure top O_2 blow of open-hearth (OH) and Khalilovo (KH) pig iron for production of steel (St) or intermediate products (I) are set forth (see also RZhMet, 1956, Nr 10, abstract 9948; 1957, Nr 9, abstract 16503). Absence of N_2 in the blow makes it possible to use the following coolants: 6% ore or up to 20% scrap when producing St from OH and up to 27.5% scrap from KH. The duration of an electrical heat using I containing 0.50-0.68% C and not over 0.025% P was reduced from 6 hours to 2 hours and 40 minutes. Automation of the converter (K) process and control of bath composition and temperature constitute an important problem. To increase the life of the lining, which average 100 heats, it is necessary to increase the thickness of the

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Oxygen Conversion of Open-hearth Pig Iron Converters

brickwork and the capacity of the K while increasing the distance from the wall to the O_2 jet. Moreover, it is necessary to deliver steam along with O_2 delivery. When KH is blown in a basic K, the yield of molten St is 80% and the residual Cr in the St is 0.2-0.5%. I for open-hearth furnaces contain not less than 1% C, not more than 1% Cr, not more than 0.05% P. Preliminary engineering and cost calculations demonstrate the advantages of the production of St in K from KH rather than from I. The state of the basic Bessemer (Thomas) process in Belgium, Luxembourg, and France is briefly described.

V. Ya.

Card 2/2

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S. G.

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AUTHORS: Afanas'ev, S. G., Shumov, M.M., Epshtein, Z.D., Andreyev, T.V., Kvitko, M.P. and Gurskiy, G.V. (Ts.NIIChM and Novo-Tul'sk Works).

TITLE: Some preliminary data on the application of the convertor process for the production of steel from Khalil pig iron. (Predvaritel'nye dannye po konverternomu peredelu Khalilovskogo chuguna).

PERIODICAL: "Stal'" (Steel), 1957, No.4, pp.310-317 (U.S.S.R.)

ABSTRACT: As steel made from Khalil pig iron in air blown convertors is characterised by high sulphur, phosphorus and gas contents a duplex melting shop was designed for the Orsk-Khalilovsk Metallurgical Combine. This consisted of 8 open hearth furnaces (185 tons each) and 3 Bessemer convertors (30 tons each). A preliminary treatment in a basic Bessemer convertor produced a semiproduct of the following composition: C 2.0%, Si 0.05%, Mn 0.10%, P 0.3%, S 0.06%, Cr 0.4%, Ni 1.23%. An effective dephosphorisation could not be obtained due to the formation of viscous inactive slags. Therefore, the possibility of obtaining low phosphorus semiproduct as well as low carbon steel by top oxygen blowing was investigated. For the investigation Khalil pig iron (C 3.9-4.2; Mn 0.25-0.50; Si 0.74-1.0; Cr 2.6-3.0; Ni 0.85-1.25; P 0.3-0.35) was melted in a cupola, desulphurised with soda ash (50% reduction in sulphur) and transferred into the convertor (8.14 m^3

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

133-8-5/28

AUTHORS: Afanas'yev, S.G., Shumov, M.M., Epshteyn, Z.D., Andryev, T.V., Beda, N.I., Korobov, I.I., Kostenetskiy, O.N., Lifshits, S.I., Rubinskiy, P.S. and Filipov, S.N.

TITLE: Production of steel in top oxygen blown convertors. (Vyplavka konverternoy stali pri produvke kislorodom sverkhu).

PERIODICAL: "Stal'" (Steel), No.8, 1957, pp.693-700 (USSR).

ABSTRACT: After transfer of the Bessemer melting shop to the top oxygen blowing convertor practice, it produced 250 000 tons of steel. Summary of the operation of the melting shop is given in this paper. The melting shop consists of 3 convertors of 16.5 m^3 capacity, with a hydraulic tilting mechanism (Fig.1), with single layer lining from periclase-spinel bricks. Mean service life of the lining is about 150 heats. Lining bricks are ignited to 1680 for 8 hrs. The wear of convertor lining is shown in Fig.2. Water cooled tuyere for oxygen blowing is shown in Fig.3. Waste gas purification system consists of scrubber, ventury scrubber and cyclone (Fig.4). The efficiency of gas cleaning: dust content reduced from 40-50 g/m^3 to 0.2 - 0.5 g/m^3 (Table 1). The composition of the pig iron supplied from a mixer was as follows: Si 0.5-1.0%, Mn 1.0-1.7%, S 0.04-0.10%, P 0.07-0.11%. As a cooling

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Production of steel in top oxygen blown convertors. (Cont.)

first blowing period are shown in Figs.6 and 7 respectively in the form of frequency curves. A number of experimental melts with single slag was also carried out with satisfactory results. The comparison of nitrogen content in convertor and open hearth steels (CT.3 кп) in the form of frequency curves is shown in Fig.8. The comparison of the operating results using additions of ore in small portions and addition of ore before blowing with water additions to oxygen for the control of metal temperature during blowing is given. The monthly output of the shop increased from 13 450 t in October 1956 to 42 323 in May 1957. The monthly consumption of materials per ton of steel is given in Table 2 and the frequency distribution of melts with different yields in Table 3. The duration of blowing period varied from 13 to 22 min. The duration of the whole production cycle should be 32 min. but in actual fact it lasted longer due to longer blowing times and organisational stoppages. It is concluded that as a result of the introduction of the practice of blowing basic pig iron with technically pure oxygen from the top in basic convertors, mild rimming steel is produced little different in properties from the

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AFANAS'YEV, S.G., kand.tekhn.nauk

Smelting steel in converters with the use of oxygen. Kislorod 10 no.1:17-25 '57. (MIRA 10:11)

(Steel--Metallurgy) (Oxygen)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G., kandidat tekhnicheskikh nauk.

Blasting carbon dioxide through pig iron in converters. Kislorod 10 no.2:45 '57. (MLRA 10:9)

(Bessemer process)

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AFANAS'YEV, S.G., kand.tekhn.nauk; BEDA, N.I., inzh.; MITROFANOV, A.A., ~~RYZHKOV, P.Ya.~~, inzh.; KOTOV, N.K., inzh.; FILIPPOV, S.N. [deceased], inzh.

Quality of converter rimmed steel produced with an oxygen blast. Kislorod 10 no.4:5-13 '57. (MIRA 11:2)
(Steel)

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AFANAS'YEV, S.G., kand.tekhn.nauk.

Oxygen steel making abroad. Kislorod 10 no.4:43-44 '57.
(MIRA 11:2)

(Steel)

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AFANAS'YEV, S.G.

133-11-5/19

AUTHOR: Afanas'yev, S.G., Candidate of Technical Sciences

TITLE: The Development of the Production of Converter Steel (Razvitiye konverternogo proizvodstva)

PERIODICAL: Stal', 1957, No.11, pp. 982 - 987 (USSR)

ABSTRACT: A review of the development of the production of converter steel in the USSR is given. There are 1 table and 3 figures. There are 21 Russian references.

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SOV/137-58-10-20589

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 35 (USSR)

AUTHOR: Afanas'yev, S.G.

TITLE: The Prospects of Converter Steelmaking in the USSR (Perspektivy konverternogo proizvodstva v SSSR)

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1957, Vol 18, pp 694-702

ABSTRACT: The problem of producing high-quality converter steel with reduced N, O, P, and S contents is resolved by top blowing with O_2 in basic converters. The results of investigations at the "Novo-Tul'skiy" (New Tula) and Yenakiyevo plants are set forth. A test of a procedure developed by TsNIICherMet at Yenakiyevo shows the process to be completely controllable under industrial conditions, and that the results are reproducible. The average yield of molten steel is 87.2% in 172 heats, and the consumption of O_2 comes to 50-60 m^3/t pig iron. The experience in the industrial utilization of O_2 in converters at the im. Petrovskiy Plant shows the heat procedure to be simple and to assure stable results relative to dephosphorization. When the arrangement of the converter shop is by island blocks, the

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SOV/137-58-10-20589

The Prospects of Converter Steelmaking in the USSR

rate of output attains 10,000 t/day. The capacity of the converters is capable of being raised to 90-100 t.

V.Ya.

1. Steel--Production 2. Oxygen--Applications

Card 2/2

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~~AMANASIEV, S.G.;~~ KOSTENETSKIY, O.N.; SHUMOV, M.M.; IVANOV, Ye.V.; PAVLOV, A.I.; GARGER, K.S.; KRIVULYA, G.D.; UMNOV, V.D.; UL'YANOV, D.P.; MAMCHITS, K.A.; PETROV, S.A.; SOROKIN, A.A.; FRIDMAN, Ye.L.; EPSHTEYN, Z.D.; IVANTSOV, G.P.; NETESIN, A.Ye.

Reports (brief annotations). Biul. TSNIICHM no.18/19:106-107 '57. (MIRA 11:4)

1. Zavod im. Petrovskogo (for Kostenetskiy). 2. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for Shumov, Epshteyn, Ivantsov). 3. Vsesoyuznyy nauchno-issledovatel'skiy institut ogneuporov (for Ivanov). 4. Stal'proyekt (for Pavlov). 5. Metallurgicheskiy zavod im. Dzerzhinskogo (for Garger, Krivulya, Umnov, Ul'yanov, Mamchits, Petrov, Sorokin). 6. Dnepropetrovskiy filial Gipromeza (for Fridman). 7. TSentral'nyy institut informatsii chernoy metallurgii (for Netesin)

(Bessemer process)

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AFANAS'YEV, S.G.

LEONIDOV, N.K.

89(3) PHASE I BOOK EXPLOITATION SOV/1497

Akademiya nauk SSSR. Institut mashinovedeniya i tekhnicheskoy informatsii

Metallurgiya SSSR, 1917-1957, t. 1 (Metallurgy of the USSR, 1917 - 1957, Vol. 1) Moscow, Metallurgizdat, 1958. 745 p. 3,000 copies printed.

Ed. (Title page): I. P. Bardin, Academician; Ed. (Inside book): G. V. Popova; Tech. Ed.: O. G. Bakhar.

PURPOSE: The book is intended for scientific workers and engineers in metallurgical plants and in the machine-building industry. It may also be used by students in advanced courses in metallurgical vuzes.

COVERAGE: This collection of articles covers extensively practical and theoretical developments in Soviet metallurgy during the last 40 years. The material deals with the discovery and development of the major ore deposits and the growth of the metal industry in various parts of European and Asiatic USSR. Research institutes, laboratories, their location, and the names of the scientists and engineers involved are listed. Many papers contain so many references and names of various personalities that it was considered beyond the scope of the coverage of each article to list them. The authors claim that the processes, methods and theories described in this book reflect the most recent developments in Soviet metallurgy.

Card 1/21

Metallurgy of the USSR (Cont.) SOV/1497

Gliskov, M.A. Development of Furnace Theory in the USSR 270

The author traces the development of scientific design of furnaces in the Soviet steel industry. The application of physical and chemical principles is presented in chronological order. The theoretical aspects of furnace operation and combustion processes are still under investigation. There are 52 references, 50 Soviet, 1 French, and 1 English.

Afanas'yev, S.G. Production of Converter Steel in the USSR 283

An outline is given of the development of converter steel production in the USSR. It is stated that present developments in the steel industry favor the converter process, especially the Thomas process, as it is suitable for handling high-phosphorus ores. The ores found in the Kerchensk area and the phosphoritic ores in the Kustanay area in Kazakhstan are treated by the Thomas process. Blowing with oxygen is said to have opened new possibilities for the converter process in the USSR. There are 26 Soviet references.

Bémerul, F.P. Production of Electric Steel in the USSR 295

The author traces the development of electric steel production from the early twenties to the Sixth Five Year Plan. Production of steel is

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

130-58-2-19/21

AUTHOR: Afanas'yev, S.G., Candidate of Technical Sciences

TITLE: Converter Steel Making Practice in Austria (Konverternoye proizvodstvo v Avstrii).

PERIODICAL: Metallurg, 1958, Nr 2, pp 37 - 39 (USSR)

ABSTRACT: This account of Austrian converter steel-making practice is based on information obtained by a delegation of Soviet metallurgists which visited steelworks in that country recently. Some comparisons are made with Soviet practice. There are 2 figures and 1 Soviet reference.

ASSOCIATION: TsNIIChM

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Card 1/1

1. Steel-Austria-Production

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LIFSHITS, S.I., kand. tekhn. nauk; AFANAS'YEV, S.G., kand. tekhn. nauk

Technology of top blowing pig iron with oxygen in basic converters. Metallurg 3 no.5:12-16 My '58. (MIRA 12:1)

1.Zavod imeni Petrovskogo i TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.
(Bessemer process) (Oxygen--Industrial applications)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AUTHOR: Afanas'yev, S. G., Candidate of Technical Sciences SOV/67-58-4-11/29

TITLE: News From Periodicals (Po stranitsam zhurnalov)

PERIODICAL: Kislorod, 1958, Nr 4, pp. 39-39 (USSR)

ABSTRACT: This article describes a converter plant which is in operation at the Witten works in the German Federal Republic. An example showing the operation of an oxygen blower in connection with a converter is given. An article published by A. Richter and S. Cohneu in the periodical "Stahl und Eisen" on hot blasting in open-hearth furnaces and the method of founding employed by the Linz-Donawitz works is mentioned.

Card 1/1 1. Oxygen—Production 2. Industrial equipment—Germany

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AUTHOR: Afanas'yev, S. G., Candidate of Technical Sciences SOV/67-58-4-15/29

TITLE: A Converter of the Krivoy Rog Metallurgical Plant (Konverternyy tsekh Krivorozhskogo metallurgicheskogo zavoda)

PERIODICAL: Kislorod, 1958, Nr 4, p. 41 (USSR)

ABSTRACT: In December 1957 a new converter was established at the above plant. When producing steel, blasting with technically pure oxygen is carried out from top to bottom by means of a water-cooled device. Converters have a volume of 35 t. By the end of this year a further number of converters is intended to be established at the same plant. Special elevators are provided for repairs to be carried out, and with their help it is possible to transport converters from and to the repair stands. Oxygen having a purity of 98-99% is conveyed from the oxygen station through the pipelines to the converters. These lines are double (one is in reserve), they have a diameter of 300 mm and a total length of 690 m. The oxygen station has 3 air-fractionating apparatus KT-3600Ap with an output of 3600 m^3/h, and it is intended that two further apparatus of the same output shall be

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added. For the purpose of conveying oxygen to the place of consumption 5 oxygen compressors (5G-3600/15) are provided. They have an output of 3600 m^3/h at a pressure of 16 atmospheres in excess of atmospheric pressure. The oxygen is dried by means of 5 drying blocks which are, however, not in operation at present. All work carried out by these converters is mechanized or automatized. This converter is described as being the best in Europe. It is provided with a large number of devices by means of which automatic control of the purity of the oxygen, its consumption, pressure, water-level, and the temperature of the water in the cooler is made possible.

1. Steel—Production 2. Blast furnaces—Equipment
3. Oxygen—Performance 4. Oxygen—Control systems

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

130-58-5-7/16

AUTHORS: Lifshits, S.I. Candidate of Technical Sciences, and Afanas'yev, S.G., Candidate of Technical Sciences.

TITLE: The Technology of Top-blowing Pig Iron with Oxygen in Basic Converters (Tekhnologiya produvki chuguna kislorodom sverkhu v osnovnykh konverterakh)

PERIODICAL: Metallurg, 1958, Nr 5, pp 12 - 16 (USSR).

ABSTRACT: In order to obtain steel of open-hearth quality in converters, the converter shop (Figure 1) at the imeni Petrovskiy Works was changed over to top-blowing with oxygen in basic-lined 20 m^3 converters (Figure 2). The authors outline materials handling, gas cleaning (scrubber, venturi and cyclone), tapping (into ladles on ladle-carriers and then into ingot-moulds on bogies), the lance (42-mm diameter copper cylindrical jet, water cooled lance) and refractories. Refractory life is given as 160-180 and work to improve this is proceeding. The hot metal composition was found to have a great influence on the process and steel quality (Figure 3); the normal composition is 0.5 - 0.8% Si, 1.0 - 1.8% Mn, 0.07 - 0.09% P and 0.05 - 0.08% S. Additions of ore, lime and bauxite are made (800-1200, 1000 -1100 and 100-150 kg, respectively) before starting the blowing of the 25-26 ton charge of hot metal. Technically pure oxygen at 10-12 atm

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130-58-5-7/16

The Technology of Top-blowing Pig Iron with Oxygen in Basic Converters

(gauge) and 65-80 m^3/min is blown for 13-15 min, the whole cycle taking about 30 min. The first slag $CaO:SiO_2$ = 1.5-1.8 is run off after 5-6 min and 500-800 kg of lime, 300-800 kg of ore and 150 kg of bauxite are added. The authors briefly discuss the merits of ore as a cooling addition and give data on changes in metal and slag compositions and metal temperature during the process (3-15 min from the start of the blow (Table 2, Figure 4) and in gas composition (Table 3). After discussing various kinetic aspects of the process, the authors list the following main conclusions from the experience described: in the first 3 min, 0.171% C is burnt per min, the rate rising later and the amount of oxygen required to remove 0.1% C varying within wide limits; most of the phosphorus is removed in the first three minutes of the blow; manganese reduction begins at the start of the second period (after changing slags) and the element is re-oxidised with low-carbon steels at the end; silicon is oxidised in the first minutes; the sulphur-content is reduced by 26.3% from the initial value, the nitrogen content falls during the blow, the normal slag ($CaO:SiO_2$ = 2.5-3.1, 16-22% SiO_2, 43-50% CaO, 6-11% FeO and 8-14% MnO) is formed in the last 3-5 min; oxidation of

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The Technology of Top-blowing Pig Iron with Oxygen in Basic Converters 130-58-5-7/16

iron occurs when the carbon content of the metal falls towards the end of the blow; magnesia from the lining appears in the slag. The 1957 productivity of the shop with the use of oxygen was 101.5% of the 1956 value; the mean daily production of the shop in February, 1958, was 110 tons greater than with air blowing. There are 4 figures and 3 tables.

ASSOCIATION: Zavod im. Petrovskogo (Plant imeni Petrovskiy) and TsNIIChM

Card 3/3

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133-58-5-8/31

On the Gas Saturation of Convertor Steel Smelted with Oxygenated Blast

frequency curves of the nitrogen content in convertor (a) and open hearth (b) steel on the Petrouskiy Works - Fig.6; the dependence of oxygen content of basic Bessemer steel on the temperature before the removal of slag (A) and on the concentration of iron in slag at a temperature of $1650^{\circ} \pm 5^{\circ}C$ (B), using air, 30% oxygen enriched and oxygen (92% O_2) blast (a, b and v respectively) - Fig.7; the equilibrium curve (theoretical) of the dependence of contents of [C] and [O] for open hearth metal (a) in comparison with the field of the actual oxygen content in open hearth bath (b) according to Ref.1, and data collected by TsNIIChM (v) for convertor metal produced by top blowing of pure oxygen - Fig.8; the dependence of oxygen content of metal on its carbon content - Table 1; the content of oxygen in the convertor bath at various levels of FeO in the slag (on smelting steel with 0.55 to 0.78% C) - Table 2; the dependence of oxygen content in low carbon steel on the iron content of slag - Table 3; the content of oxygen in various steels after deoxidation - Table 4. It is concluded that in order to produce steel

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AUTHOR: Afanas'yev, S.G., Candidate of Technical Sciences 67-58-3-11/18

TITLE: Technical Engineering in Foreign Countries. Some Data Concerning the Operation of Oxygen Stations Serving Converter Plants (Inostrannaya tekhnika. Nekotoryye dannyye o rabote kislorodnykh stantsiy, obsluzhivayushchikh konverternyye tsekhi)

PERIODICAL: Kislorod, 1958, vol. 11, Nr 3, pp. 42-43 (USSR)

ABSTRACT: The author mentions data which he obtained from steel works in Canada, Austria, USA, and Belgium. The "best solution" is considered by him to be that found at the "Donawitz" Works in Austria. A schematic drawing shows the steel-foundry plant of the said works. There are 4 figures, and 3 references.

1. Steel industry 2. Oxygen--Production

Card 1/1

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AFANAS'YEV, S.G., kand.tekhn.nauk

Converter section with oxygen blast in the German Federal Republic (from "Stahl und Eisen," no.5, 1958). Kislorod 11 no.4:39 '58. (MIRA 11:8)
(Witten, Germany--Bessemer process)

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AFANAS'YEV, S.G., kand.tekhn.nauk

Converter plant in U.S.A operating with oxygen blast (from "Iron and Steel Engineer," no.1, 1958 and "Iron and Steel," no.3, 1958). Kislorod 11 no.5:61-62 '58. (MIRA 11:12)
(Aliquippa, Pennsylvania--Steel)

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AFANAS'YEV, S.G., kand. tekhn. nauk; SHUMOV, M.N., insh.

Gas-saturated converter steel smelted with use of an oxygen blow [with summary in English]. Stal' 18 no.5:405-410 My '58. (Bessemer process) (MIRA 11:6)

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AFANAS'YEV, S.G.

18(5) PHASE I BOOK EXPLOITATION SOV/2861

Bardin, Ivan Pavlovich, Sergey Gavrilovich Afanas'yev, Mikhail Mikhaylovich Shumov, and Zinoviy Davidovich Epshteyn

Primeneniye kisloroda v konverternom proizvodstve stali (Use of Oxygen in the Production of Converter Steel) Moscow, Metallurgizdat, 1959. 264 p. Errata slip inserted. 2,500 copies printed.

Ed.: A. Ye. Netesin; Ed. of Publishing House: L. V. Yablonskaya; Tech. Ed. : V. V. Mikhaylova.

PURPOSE: This book is intended for technicians in metallurgical plants and planning organizations.

COVERAGE: The book presents results of investigation and pilot-plant testing of the application of oxygen in the converter production of steel. Experience gained outside the Soviet Union in the operation of converters with the use of oxygen is discussed. Comparative technical and economic data on steelmaking processes are given, and equipment used for the

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AFANAS'YEV, S.G., kand.tekhn.nauk

Safe working conditions in converter shops. Bezop.truda v prom. 3 no.7:17-18 Jl '59. (MIRA 12:11)
(Steel--Metallurgy--Safety measures)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

SOV/133-59-9-6/31

AUTHORS: Afanas'yev, S.G., Shumov, M.M., Epshteyn, Z.D. Ryazanov, F.F., Kozin, G.N. and Kukuruznyak, I.S.

TITLE: Use of Oxygen in the Convertor Melting Shop of the „Krivorozhstal'„ Works

PERIODICAL: Stal', 1959, Nr 9, pp 787-792 (USSR)

ABSTRACT: An outline of the composition of the convertor melting shop including some details regarding oxygen blowing equipment and the method used for the cleaning of the convertor waste gas, the influence of the composition of iron on the composition of the finished steel and some operating results are given. Main points: The tuyere supplying oxygen to the convertor can be moved with a special mechanism vertically up and down and rotate around the vertical axis by 120 to 128° (Fig 1). Gases leaving the convertor are passed successively through a hood, lined stack, waste gas main, scrubber, Ventury, cyclone, fan into the chimney. The scrubber (5 m dia, height of the cylindrical part 18 m) serves mainly to cool the gas and to trap larger dust particles; it consumes 200 to 300 m^3/hr of water at a pressure of 6 to 9 atm. Due to the high velocity of the gas (60 to

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Use of Oxygen in the Convertor Melting Shop of the „Krivorozhstal'" Works

120 m/sec) the water is dispersed into a fine mist. In the Ventury tube with a throat diameter of 510 mm, particles of mist with suspended solids coagulate into comparatively large drops of a slurry which are caught in the cyclone and passed into the Dorr pond. No data on the degree of cleaning of the gas are given. The composition of pig iron used varies within the following limits: Si, 0.50 - 0.80; Mn, 1.0 - 1.4; S, 0.030 - 0.055; P, 0.09 - 0.11. The influence of silicon in pig iron on the content of phosphorus in the finished steel is shown in Fig 3. The optimum amount of silicon in pig was found to be 0.4 to 0.6%. Desulphurization of metal deteriorates with decreasing manganese content in the pig iron. Pig iron containing 0.055% sulphur should contain not less than 1.44% of manganese. The quality of lime has a considerable influence on the rate of formation and nature of the slag. In view of a considerable proportion of incompletely fired lime (up to 20%) an addition of bauxite (1.5 to 2%) is used. Changes in the composition of metal during blowing are shown in Table 1 and frequency distribution of costs with various levels

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SOV/133-59-9-6/31

Use of Oxygen in the Convertor Melting Shop of the „Krovorozhstal'„ Works

of sulphur and phosphorus content for various types of steel produced in Table 2. Various types of tuyere nozzles for blowing oxygen were tested (Fig 4), the best results were obtained with a cylindrical nozzle of 65 mm diameter with the outlet widening to 75 mm. The optimum rate of blowing oxygen was found to be about 105 m^3/min at a distance of 800 to 1000 mm between the nozzle and surface of the metal. Consumption of materials per ton of steel mean weight and duration of a heat are shown in Table 3. The average weight of heat varied from 33 to 42 tons. Individual heats with charges of 70 to 72 tons confirmed the possibility of blowing a large amount of metal with 1 tuyere. At present, Gipromez is planning designs for the transfer of convertor for 53 to 55 ton charges with subsequent bottom pouring of metal into 6 eight ton ingots. It is concluded that some improvements in the productivity can be obtained by operation without the intermediate removal of slag, providing the quality of raw materials is improved. The durability of convertor lining varied

Card 3/4

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SOV/133-59-9-6/31

Use of Oxygen in the Convertor Melting Shop of the „Krovorozhstal'„ Works

from 78 to 170 heats. The quality of steel produced corresponded to requirements of GOST 380-50 for open hearth steel (nitrogen content on average 0.006%). The actual degree of desulphurization obtained amounted to 50% (of the whole sulphur introduced into the bath with materials charged). The construction of 80 to 100 ton convertors is considered advantageous. There are 4 figures and 3 tables.

ASSOCIATIONS: TsNIIChM and Zavod „Krivorozhstal'„ („Krivorozhstal'„ Works)

Card 4/4

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.; SHUMOV, M.M.; KVITKO, M.P.

Basic regularities in the process of top-blowing of pig iron by oxygen. Stal' 20 no.10:884-892 O '60. (MIRA 13:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.
(Bessemer process)

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PHASE I BOOK EXPLOITATION SOV/5407

Afanas'yev, S.G., Candidate of Technical Sciences; B.S. Barskiy, Docent; Yu.Ye. Yefroymovich, Candidate of Technical Sciences; V.Yu. Kaganov, Candidate of Technical Sciences; B.N. Katomin, Engineer; V.Ye. Leykin, Engineer; I.N. Lur'ye, Engineer; O.A. Mikhaylov, Candidate of Technical Sciences; A.Ye. Netesin, Engineer; M.Ye. Orman, Engineer; V.S. Rutes, Candidate of Technical Sciences; and Ye.A. Shneyerov, Candidate of Technical Sciences.

Tekhnicheskiy progress v chernoy metallurgii SSSR; staleplavil'noye proizvodstvo (Technological Progress in Soviet Ferrous Metallurgy; Steelmaking Industry) Moscow, Metallurgizdat, 1961. 495 p. Errata slip inserted. 3,200 copies printed.

Sponsoring Agencies: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov SSSR. Tsentral'nyy institut informatsii chernoy metallurgii.

Ed. and Scientific Ed.: G.N. Oyks, Professor, Doctor of Technical Sciences; Director of the Central Institute for Information on Ferrous Metallurgy: N.B. Arutyunov; Chief Ed.: Ya.A. Gol'din; Ed. of the Central Institute for Information on Ferrous Metallurgy: L.I. Khoras; Ed. of Publishing House: V.I. Ptitsyna; Tech. Ed.: P.G. Islent'yeva.

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AFANAS'YEV, S.O.

115

PHASE I BOOK EXPLOITATION SOV/5411

Konferentsiya po fiziko-khimicheskim osnovam proizvodstva stali. 5th, Moscow, 1959.

Fiziko-khimicheskiye osnovy proizvodstva stali; trudy konferentsii (Physicochemical Bases of Steel Making; Transactions of the Fifth Conference on the Physicochemical Bases of Steelmaking) Moscow, Metallurgizdat, 1961. 512 p. Errata slip inserted. 3,700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova.

Responsible Ed.: A. M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: Ya. D. Rozentsveyg. Tech. Ed.: V. V. Mikhaylova.

Card 1/16

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

Shumov, M. M. Producing Steel and Semifinished Products in a Converter by Using Naturally Alloyed Chromium Pig Iron 268

Gurevich, B. Ye., V. D. Epshteyn, and T. V. Andreyev. Determining the Optimum Conditions of Slag Formation, Dephosphorization, and Decarburization of High-Phosphorus Pig Iron in a Semicommercial Converter With Oxygen Top Blowing 281

Baptizmanskiy, B. I., and Yu. A. Dubrovskiy. Investigating the Converter-Steel Contamination in Oxygen Top Blowing 292

Mazun, A. I., and A. S. Ovchinnikov. Gas Content in Steel Made in a Converter With Various Types of Blasts and Blowing 299

Afanas'yev, S. G., M. M. Shumov, and M. P. Kvitko. Some Kinetic and Process Regularities in the Oxygen Top Blowing of Pig Iron 308

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.

Converter method of steel making in capitalist countries. Biul. tekh.-ekon.inform. no.10:81-85 '61. (MIRA 14:10)
(Bressemer process)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

S/148/61/000/011/004/018
E071/E180

AUTHORS: Afanas'yev, S.G., and Turkenich, D.I.

TITLE: On the problem of desulphurisation of metal in a basic oxygen blown convertor

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no.11, 1961, 57-59

TEXT: The equilibrium distribution of sulphur between metal and slag in an oxygen top blown basic convertor can be calculated from:

$$\eta_{S_{equil.}} = \frac{(S)_{equil.}}{[S]_{equil.}} = K_S \frac{(n_{FeO} + n_{bas.})(n_{FeO} + n_{bas.} - n_{acid}}{n_{FeO} \cdot \gamma_{S^{--}}} \quad (2)$$

where: K_S - the equilibrium constant of the desulphurisation reaction; n_{FeO} - number of moles of ferrous oxide in 100g of slag; n_{acid} - number of moles of acid oxides in 100g of slag; $n_{bas.}$ - number of moles of basic oxides in 100g of slag; $\gamma_{S^{--}}$ - activity coefficient of sulphur ions in slag which can be calculated from:

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$$\lg \gamma_S = 1.53 \frac{n_{acid}}{n_{FeO} + n_{bas.} - n_{acid}} - 0.17 \qquad (3)$$

The equilibrium distribution of sulphur for a typical convertor slag (48.0% CaO, 20.0% SiO_2, 10.0% FeO, 3.0% Fe_2O_3, 2.5% Al_2O_3, 5.0% MgO, 10.0% MnO, 1.5% P_2O_5) was found to be 6.6. The actual coefficient of distribution encountered in practice varies from 3.4 to 5.3. Therefore the equilibrium is not reached. Methods of improving the desulphurisation by earlier formation of basic slag are discussed (blowing in fine lime, use of basic sinter, use of fluorospar, increasing FeO content of slag). However, in view of thermodynamic limitations of the degree of desulphurisation which can be attained, the sulphur content of iron should be limited to 0.04-0.05%. A.M. Samarin, L.A. Shvartsman, M.I. Temkin and I.I. Bornatskiy are mentioned in the article.
There are 1 figure and 5 Soviet-bloc references.

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

On the problem of desulphurisation.. S/148/61/000/011/004/018
E071/E180

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii
(Central Scientific Research Institute of Ferrous Metallurgy)

SUBMITTED: March 3, 1961

Card 3/3

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.

Making oxygen-blown converter steel. Metallurg 6 no.10: 18-20 O '61. (MIRA 14:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.

(Steel--Metallurgy)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G., kand.tekhn.nauk; KHUDYAKOV, N.A., kand.tekhn.nauk; VAYNTRAUB, S.S.

Open-hearth furnace of oxygen converter; concerning A.N. Myrtsymov's article published in "Stal'" no.1, 1961. Stal' 21 no.8:695-698 Ag '61. (MIRA 14:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for Afanas'yev). 2. Ural'skiy institut chernykh metallov (for Khudyakov). 3. Alchevskiy metallurgicheskiy zavod (for Vayntraub).

(Open-hearth furnaces)
(Converters)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.

S/123/62/000/003/001/008
A054/A127

AUTHORS: Voinov, S. G., Kosoy, L. F., Shumov, M. M., Shalimov, A. G., Chekhomov, O. M., Andreyev, T. B., Afanas'yev, S. G., Kalinnikov, Ye. S.

TITLE: Refining converter steel with liquid synthetic slag in the ladle

PERIODICAL: Stal', no. 3, 1962, 226 - 232

TEXT: The good results obtained in refining electric steels with liquid lime-aluminous slag led to pilot-plant tests with converter steels, using the same method. 111 heats were smelted in a basic 8-ton converter; 46 of them were refined in the ladle with liquid synthetic slags of the following composition (in %):

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Refining converter steel with...

Steel grade	Number of heats	CaO	Al_2O_3	SiO_2	MgO	FeO	Cr_2O_3
ШХ15 (ShKh15)	6	55.26 / 53.04	42.73 / 41.47	1.90 / 3.66	0.79 / 0.80	0.82 / 0.90	0.30 / 0.17
12ХН3А, 06Н3 (12KhN3A), (06N3)	5	52.49 / 49.82	42.46 / 36.94	2.02 / 5.06	0.78 / 0.82	0.90 / 7.69	0.94 / 0.92
СГБ (SGV) (deep drawing steel)	7	53.10 / 51.37	44.22 / 38.34	2.19 / 4.52	0.75 / 0.93	0.65 / 4.05	0.23 / 0.23
У (I) (tool, carbon, cable, rail, axle steel)	14	53.58 / 52.51	44.08 / 40.92	2.06 / 3.61	0.69 / 0.72	0.70 / 1.75	0.15 / 0.13

(numerator: composition prior to metal treatment; denominator: composition after the treatment). The slag was melted in a 3-ton arc furnace, with hearth and banks of carbon blocks and carbon packing. The slags differed from those used for electric steels in that they contained more silica, ferrous oxides and

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chrome oxides. To maintain the fluidity and reactivity of the slag under the test conditions, its quantity was increased to 6.5% of the metal weight, the temperature of the liquid slag in the furnace was raised to 1,750 - 1,850°C and the interval between pouring the slag and tapping the metal was reduced (to 2 min. 5 sec. on the average). The ladle was preheated to 600 - 800°C prior to slag tapping. The basic slag forming additives were common open-hearth lime (with up to 0.2% S), bauxite and in some cases (for medium-carbon and high-carbon steel grades) fluorite. Lime was added in two batches: prior to pouring the cast iron and 4 - 5 minutes after blowing started; the other two components were added together with lime. The quantity of the latter used for alloy and high-grade steels was 8 - 9%, for rail and axle steel 6 - 7% of the charge weight. ShKh15, 12KhN3A, 05N3 grades, deep-drawing steel and carbon (tool) steels were cast with fluorite (0.3 - 0.8% of the charge weight; the slag was tapped twice.) To determine the optimum cast iron composition, cast irons with components varying greatly in amount were used (0.28 - 0.78% Si, 0.50 - 1.80% Mn, 0.025 - 0.095% S, 0.086 - 0.220P). The slags were very active already at the beginning of blowing. The basicity of slags ($CaO:(SiO_2+P_2O_5)$) increased progressively (5 - 5 1/2 minutes after blowing started it was 2.0, at the end of blowing: 3.0 - 4.0). The synthetic slag refining method in converters with oxygen top blast results in a

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high degree of desulfuration. When cast irons are processed with a high (0.085 - 0.095%) sulfur content, this could be reduced to 0.030 - 0.042% during blowing and to 0.009 - 0.013% after slag treatment. Desulfuration is most effective in the У10-У13А (U10-U13A) grades (up to 72.8%), in axle steel (71.9%) and ШХ15 steel grade (67.8%). The final phosphorus content of steel can also be reduced to 0.020 - 0.030% by slag treatment, even if made of cast iron containing [illegible].22% phosphorus. The synthetic slag method reduces the content of oxygen and non-metallic inclusions (sulfides, oxides) of the steel. Converter structural steel grades, refined by synthetic slag, have a greater ductility and notch toughness (mainly across the fibre), than conventional converter, open-hearth and electric steels. Most probably, the ductility is improved by the effect of the synthetic slag emulsion on the metal which reduces the sulfur content and non-metallic inclusions; a sub-microscopic silicium-oxygen phase may also have some effect. Slag-refined converter axle steels displayed a high ductility at -20°, -40° and -60°C, the new refining method imparts the 06N3 cold-resistant converter steel at 150 - 183°C the same degree of frost-resistance as found in electric steels. The tests were carried out with A. N. Korneyenkov, O. V. Gurskiy, Ya. M. Bokshitskiy, A. K. Petrov, Ye. D. Mokhir, R. I. Kolyasnikova, O. A. Khasin, V. P. Danilin,

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S/133/62/000/003/001/008
A054/A127

Refining converter steel with...

P. S. Plekhanov, A. I. Mazun, and A. A. Markin participating. There are 3 figures, 9 tables and 2 Soviet-bloc references.

Card 5/5

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S. G.

Expanding the smelting of steel in oxygen-blown converters. Metallurg 7 no.11:5-6 N '62. (MIRA 15:10)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.

(Steel--Metallurgy) (Converters)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G., kand.tekhn.nauk

Converter again comes to the forefront. Nauka i zhizn' 29 no.3:33-38 Mr '62. (MIRA 15:7)

1. Nachal'nik konvertornoy laboratorii TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Bessemer process)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

KVITKO, M.P.; SHUMOV, M.M.; AFANAS'YEV, S.G.

Investigating the oxygen-converter process for the converting of low-manganese pig iron. Stal' 23 no.6:501-508 Je '63. (MIRA 16:10)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

PSHEKHOTSKAYA, R.V.; AFANAS'YEV, S.G., kant. tekhn. nauk, red.

[Use of oxygen in the converter process; a bibliography] Primenenie kisloroda v konverternom proizvodstve; bibliograficheskii ukazatel'. [By] R.V.Pshekhotskaia. Moskva, 1962. 129 p. (MIRA 17:8)

1. Moscow. TSentral'naya nauchno-tekhnicheskaya biblioteka chernoy metallurgii.

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7"

"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.G.; DUKHANIN, A.S.; KVITKO, M.P.; SHUMOV, M.M.; DARUSHIN, R.I.; KOSHKIN, V.A.; ZAKHARENKO, N.I.; KRITININ, I.A.

Railroad rails made of oxygen-blown converter steel. Stal' 24 no.1:72-73 Ja '64. (MIRA 17:2)

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KAZANSKIY, V.V. (Moskva); LEVENETS, N.P. (Moskva); AFANAS'YEV, S.G. (Moskva); SHUMOV, M.M. (Moskva)

Viscosity of phosphate slags in the oxygen-blown converter process. Izv. AN SSSR. Met. i gor. delo no.6:64-69 N-D '64. (MIRA 18:3)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

SINEL'NIKOV, V.A.; AFANAS'YEV, S.G.

Making electrical steel in oxygen-blown converters. Metallurg 10 no.12:17-19 D '65. (MIRA 18:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii im. Bardina.

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AFANAS'YEV, S.G.; MARININ, A.V.

Nonmetallic inclusions in converter steel. Stal' 25 no.9:807-809 S '65. (MIRA 18:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.

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AFANAS'YEV, S.I., elektromekhanik

Inductive method for monitoring a call. Avtom., telem. i sviaz' 6 no.9:37 S '62. (MIRA 15:9)

1. Mogilevskaya distantsiya signalizatsii i svyazi Belorusskoy dorogi.

(Railroads—Communication systems)

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S/081/62/000/019/027/053
B101/B180

AUTHORS: Yurchenko, P. F., Afanas'yev, S. K.

TITLE: Optical method of measuring the depth of deposits on engine pistons

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1962, 448-449, abstract 19M182 (Novosti neft. i gaz. tekhn. Neftepererabotka i neftekhimiya, no. 3, 1962, 19 - 21)

TEXT: A method is described for measuring the depth of carbon deposits (CD) on the pistons and other parts of internal combustion engines. Over a portion of the piston surface along the generating line, a layer of CD is removed down to the metal surface so that the contour along the generatrix is revealed in layers and the depths of these stages can be measured from the side with a microscope. Measurements of CD thickness are given for various parts of a 1ч. 8.5/11 (1 ch. 8.5/11) diesel engine piston after 2000 hrs operation on ДГ-11 (DG-11) diesel oil with ЦНАТИМ-339 (TsIATIM-339) additive (ГОСТ 5304-54 (GOST 5304-54)), and a low-sulfur fuel (ГОСТ 4749-49 (GOST 4749-49)). The CD was much thicker

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'IEV, S. L.

Afanas'yev, S. L. "The geology of Paleocene deposits of the western part of the Transcarpathian Oblast," In the symposium: Nauch. raboty studentov gorno-metallurg. in-tov Moskvy, Moscow, 1949, p. 45-69,--Bibliog: 15 items

SO: U-4934, 29 October 1953, (Letopis 'Zhurnal 'nykh Statey, No. 16, 1949)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

KHAIN, V. Ye., AFANAS'YEV, S. L., BURLIN, Yu. K., GOFMAN, Ye. A., LOMIZE, M. G. and RIKHTER, V. G.

AFANAS'YEV, S. L.

"New Data on the Geology of the North-Western Caucasus,"

report delivered in the Geologic Section, 1 March-4 June 1957.

Chronicle of the Activity of the Geologic Section, Byulleten' Moskovskogo Obshchestva Ispytateley Pririody, Otdel Geologicheskiy, No. 6, p. 115-118, 1957.

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S. L.

5-6-19/42

AUTHORS: Khain, V.Ye., Afanas'yev, S.L., Gofman, Ye.A., Lomize, M.G., and Rikhter, V.G., Burlin, Yu.K.

TITLE: New Data on the Geology of the North-Western Caucasus (Novyye dannyye po geologii severo-zapadnogo Kavkaza) Between the Tuapse and Lazarev Crossings (mezhdu Tuapsinskim i Lazarevskim peresecheniyami)

PERIODICAL: Byulleten' Moskovskogo Obshchestva Ispytateley Prirody, Otdel Geologicheskiy, 1957, # 6, pp 132-133 (USSR)

ABSTRACT: A Caucasian expedition of the MGU, composed of the authors of this paper, carried out during 1955 to 1956 a detailed mapping in the upper parts of the rivers Pshekha, Pshish and Ashe. The expedition studied the following three structural zones of this territory: 1. The monoclinorium of the northern slope; 2. the central anticlinorium; and 3. the flysch zone of the southern slope.

As a result of these explorations, the stratigraphy of the Lower- and Middle-Jurassic deposits was clarified in details and differences in the structure of their columnar sections were discovered. These differences are connected with the structural zonation and deep breaks.

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AFANAS'YEV, S.L.

Method for correlating flysch sediments. Vest.Mosk.un.Ser.4: Geol. 15 no.3:24-31 My-Je '60. (MIRA 13:8)

1. Kafedra dinamicheskoy feologii Moskovskogo universitea. (Flysch)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.L.; MASLAKOVA, N.I.

New data on the correlation of the upper Senonian in the Novorossiysk region. Izv. vys. ucheb. zav.; geol. i razv. 3 no.5:50-55 My '60. (MIRA 13:11)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Novorosiysk region--Geology, Stratigraphic)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.L.

Classification of clay and carbonate rocks. Izv. vys. ucheb. zav.; geol. i razv. 3 no.8:43-48 Ag '60. (MIRA 13:10)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Rocks, Sedimentary)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.L.; ANDREYEVA, M.V.; SHVEMBERGER, Yu.N.

Flysh sediments of the Danian series and Lower Paleogene of the southern slope in the western Caucasus. Trudy VNIGNI no.34:193-213 '61. (MIRA 15:7)

(Caucasus--Flysh)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANAS'YEV, S.L.

Changes in the thickness of layers in flysch. Vest.Mosk. un. Ser. 4: Geol. 16 no.2:42-51 Mr-Ap '61. (MIRA 14:4)

1. Kafedra dinamicheskoy geologii Moskovskogo universiteta.
(Caucasus--Flysch)

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"APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100410017-7

AFANASIEV, S. L. [Afanas'yev S. L.]

Variability of layer width in flysch deposits. Analele geol geogr 15 no.4:42-52 O-D '61.

(Flysch)

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AFANAS'YEV S.P.

ARTEMOV, D.M.; RUDENKO, P.A.; BOYARIN, B.Ya.; KURTSEV, V.V.; VOLODINA, M.A.; KRIVOVAYA, V.I.; KOROLEV, I.V.; BUDNIKOVA, Z.M.; METAL'NIKOVA, A.L.; AFANAS'YEV, S.P., red.; TUDKOVA, N., red.; YAKOVLEVA, Ye., tekhn. red.

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AFANAS'YEV, S.P.; SHIFMANOVICH, N.M.[deceased]; SHPAKOVSKAYA, L.I., red.; SUBBOTINA, G.M., tekhn. red.

[Handbook on tolerances, threads and gages] Spravochnik po dopuskam, rez'bam i kalibram [By] S.P.Afanas'ev, N.M.Shifmanovich, Izd.3., perer. Novosibirsk, Novosibirskoe knizhnoe izd-vo, 1962. 406 p. (MIRA 16:6)

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AFANASIYEV, S. V.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr. 1954)

Name	Title of Work	Nominated by
Afanas'yev, S. V.	"An Album of Horse Breeds of the USSR"	Leningrad Agricultural Institute

SO: W-30604, 7 July 1954

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1. Leningradskiy staleprokatnyy zavod.
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