APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

Conditions for the combustion-front stabilization and the flame propagation velocity under limiting conditions. L. N. Khitrin and S. A. Gol'denberg. *Doklady Akad. Nauk S.S.S.R.* 103, 861-3(1955); cf. *C.A.* 50, 3854*bc*.—A general expression $Re_{cr.} = AS^{1/n}$ is derived for the evaluation of the crit. flame front stabilization factors, where S, called the stabilization criterion $= ud/a$ (u = normal flame velocity, d = flame diam., and a is a temp. cond. coeff.). A and n are consts., and A under varying conditions equals 1.45, while $n = 0.5$. The expression can be rewritten as $Re_{cr.} = 1.45S^2$.

W. M. Sternberg

GOLDENBERG, S. A. and KHITRIN, L. N.

"Influence of the Initial Temperature of a Combustible Mixture and of the Pressure of the Ambient Medium of the Limits of Stabilization" a paper submitted at the Sixth International Symposium on Combustion, New Haven, Conn., 19-24 Aug 56.

Goldernberg, Institute of Energetics, AS USSR, Moscow, USSR
Khiterin, AS USSR, Moscow, USSR.

GOLDENBERG, S. A., and PELEVIN, U. S., AS USSR, Moscow

"Influence of the Pressure on the Normal Velocity of the Flame," a paper submitted at the 16th International Congress of Pure and Applied Chemistry, Paris, 18-24 July 57.

GOLDENBERG, S.A.

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

Teplovaia Teoriia Zazhiganiia Gazovykh Smesei i Predel'nye Iavleniia. S. A. Gol'denberg and L. N. Khitrin. ...SSSR Otd. Tekh. Nauk Izv. Mar., 1957, pp. 142-155. 41 refs. In Russian. Development of the theory of ignition of gas mixtures and analysis of boundary phenomena.

"The influence of Preheating of Hot Mixtures and of the Pressure of the Surrounding Media on the Limits of Stabilization," by S. A. Gol'denberg and L. N. Khitrin, Power Engineering Institute, Academy of Sciences USSR, Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, No 2, Feb 57, pp 136-139

In 1955 at the Laboratory of Intensification of Fuel Processes of the Power Engineering Institute, Academy of Sciences USSR, L. A. Volodin and V. I. Andreyev carried out experimental work on the influence of the initial temperature of methane-air mixtures on flame stabilization. The tests were conducted at atmospheric pressure on a conical stabilizer with a diameter of 7 millimeters within an initial-temperature range of 20-400 degrees centigrade. The data obtained from these tests indicated flame stabilization near stoichiometry. The results of a processing of this data are given in graphic form with flow velocities at which flame-disruption occurs plotted on the ordinate axis and temperatures of the mixture on the axis of the abscissa).

Experimental data from the literature is drawn on to support an expansion of the author's theoretical work (previously published in Doklady Akademii Nauk SSSR, Vol 103, 1955, No 2 and 5) to include the influence of the pressure of fuel-air mixtures on flame stabilization. (U)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

AUTHOR: GOL'DENBERG,S.A., KHITRIN,L.N. (Moscow) PA - 3081

TITLE: The Heat Theory of the Ignition of Gas Mixtures and Phenomena in the Boundary Area. (Teplovaya teoriya zazhiganiya gazovykh smesey i predel'nyye yavleniya, Russian)

PERIODICAL: Izvestiia Akad.Nauk SSSR, Otdel.Tekhn., 1957, Vol 21, Nr 3, pp 142-155 (U.S.S.R.)
Received: 6 / 1957 Reviewed: 7 / 1957

ABSTRACT: In the introduction a survey of the entire field and the investigations carried out up to the present are given. Then the problem of ignition by a glowing body is handled and a formula is derived for a vessel with flat parallel walls (in the distance l from one another) with the temperatures T_ξ and T_0 (cold wall), which determines the ratio among the values on the ignition boundary.

The formula reads:

$$\frac{T_s - T_0}{l} = \left(\frac{2q}{\lambda} \int_{T_\xi}^{T_s} w(c,T)\, dT \right)^{1/2}$$

T_s denotes the wall temperature, T_ξ is the temperature of the exterior limit of the layer ξ, q - the heat effect, $w(c,T)$ - the expression for the reaction and λ - the heat conduction coefficient of the mixture. The ignition in a general case was investigated and

Card 1/3

PA - 3081

The Heat Theory of the Ignition of Gas Mixtures and Phenomena in the Boundary Area.

PHASE I BOOK EXPLOITATION 626

Akademiya nauk SSSR. Energeticheskiy insitut

Issledovaniya protsessov goreniya; sbornik statey po rabotam, vypolnennym v Energeticheskom institute im. G.M. Krzhizhanovskiy AN SSSR (Study of Combustion Processes; Collection of Articles on Work Done by the Power Institute imeni G.M. Krzhizhanovskogo AS USSR) Moscow, Izd-vo AN SSSR, 1958. 123 p. 3,300 copies printed.

Resp. Ed.: Khitrin, L.N., Corresponding Member, AS USSR; Ed. of Publishing House: Pobedimskiy, V.V.; Tech. Ed.: Polesitskaya, S.M.

PURPOSE: This book is meant for scientists and engineers working in the field of fuel combustion.

COVERAGE: This collection of articles represents recent research in the field of combustion processes performed at the Institute of Power Engineering imeni G.M. Krzhizhanovskiy, AS USSR. Materials studied were gaseous and vapor fuels. Problems considered were:

Card 1/18

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

Khitrin, L.N. and Gol'denberg, S.A. (Laboratory for the Intensification of Furnace Processes) Ignition of Gaseous Mixtures and Critical Characteristics 5

The authors based their research on the assumptions of Ya. B. Zel'dovich for the determination of ignition characteristics, such as: concentration limits, boundary flame velocities and flame stabilization criterion. Heated rods or spheres were used as ignition sources. N.N. Semenov [Ref. 2] and L.A. Vulis [Ref. 4] are also mentioned as contributors to combustion theory. The activation energy for methane-air mixture (E=35000) is quoted from the work of V.I. Andreyev and L.A Volodina [p. 36]. There are 9 figures, 14 equations, and 4 Soviet references.

Iyevlev, V.N. and Solov'yeva, L.S. (Laboratory for the Intensification of Furnace Processes). Experimental Study of Gas Combustion Processes in Tunnel Burners 14

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

Golovina, Ye. S. and Fedorov, G.G. (Laboratory of Combustion Physics). Effect of Physicochemical Factors on the Velocity of Flame Propagation 44

The authors studied the effect of the chemical characteristics of fuel mixtures on the velocity of flame propagation. This was achieved by varying the oxygen content in mixtures with benzene, hexane, and hexene-hexane fraction (60% hexane and 40% hexene). The results revealed a constant fuel to oxygen ratio for maximum values of flame propagation velocities, which evidently corresponds to optimum conditions for the chemical reaction in the flame front. There are 15 figures, 1 table and no references.

Gol'denberg, S.A. and Pelevin, V.S. (Laboratory of Combustion Physics). Effect of Pressure on the Flame Propagation in Laminar Flow 57

The authors studied the effect of pressure on flame velocity for gasoline-air and methane air mixtures. Experiments were conducted with a burner of d=16 mm and d= 12 mm, with a peripheral ignition source, and constant Reynolds number 1700. Pressure was varied from 760 - 100 mm. Results obtained were: for methane $U \simeq \frac{1}{\sqrt[3]{p}}$, and for gasoline $U \simeq \frac{1}{\sqrt[4]{p}}$.

There are 7 figures, 1 table, and 34 references, 10 of which are Soviet, 20 English, 3 German, and 1 French.

Gol'denberg, S.A. and Pelevin, V.S. (Laboratory of Combustion Physics). Effect of Pressure on the Flame Propagation Velocity in a Turbulent Flow 68
This study is based on the experimental work of the authors. The pressure dependence of flame propagation velocity was studied by means of a burner with d = 16 mm andlength assuring stabilization. A gasoline-air mixture was used at pressures of 760 - 100 mm and Reynolds numbers 4 - 20·10³. It was determined that

for a constant mass velocity (Re = const.) and varying pressure, the turbulent flame velocity increases according to the law $U_T \simeq \frac{1}{P^{\frac{1}{4}}}$ analogous to the variation of normal flame velocity.

The turbulent flame velocity decreases with the drop in pressure $U_T \simeq P^{\frac{1}{2}}$ at a constant flow velocity. When conditions approximate isotropic turbulence, viscosity of the medium is the main factor modifying the flame propagation velocity at variable pressures. There are 12 figures and 4 references, 3 Soviet and 1 German.

Khitrin, L.N., Golovina, Ye. S. and Sorokina, A.V. (Laboratory of Combustion Physics). Effect of Preheating the Gasoline-air Mixture on the Flame Propagation Velocity.

The authors studied the effect of preheating the fuel mixture on the flame propagation velocity in laminar and turbulent flows. The temperature of the mixture was varied from 17 to 227°C.

GOL'DENBERG, S.A.

Combustion in a turbulent flow. Inzh.-fiz.zhur. no.1:53-64 Ja '58.
(MIRA 11:7)

1.Energeticheskiy institut AN SSSR, g. Moskva.
(Combustion) (Turbulence)

AUTHORS: Gol'denberg, S. A. and Pelevin, V. S. (Moscow, [illegible])

TITLE: Influence of the pressure on the normal velocity of flame propagation. (Vliyaniye davleniya na normal'nuyu skorost' rasprostraneniya plameni).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, No.2, pp. 33-41 (USSR).

ABSTRACT: The relation between the flame velocity and the pressure can be expressed by the following approximate equation:

$$U \approx P^{(\nu/2)-1} \quad (1)$$

ν being the order of the reaction. In present day theories on tubulent flame propagation (Refs.3-11) and also on the criteria of flame stabilisation, the normal flame velocity is one of the predominant characteristics of the process. The published results of investigations of the influence of pressure on the normal flame velocity are contradictory and in most cases they are limited to the range of higher pressures and also as regards the range of investigated concentrations (Refs.15-27,32). The experimental data of some authors indicate that there is a definite relation between the flame speed and the pressure, namely, the linear velocity of the flame

Card 1/7

Influence of the pressure on the normal velocity of flame propagation.

decreases with increasing pressures. However, Voronkov and Sokolik (Ref.15), Kolodtsev and Khitrin (Refs.17 and 18), Fiock and Marvin (Ref.19) did not observe any appreciable changes in the flame velocity with pressures in the case of mixtures of CO with oxygen; determination of the flame velocity by various methods (tube, bomb) for air and oxygen mixtures lead to the conclusion that the behaviour of these mixtures differs. A number of authors obtained contradictory results in investigating mixtures of various hydrocarbons with air; the data on the dependence of the flame velocity U on the pressure P are summarised in a table, p.34. The contradictions do not relate solely to experimental data. For instance, on the basis of the results obtained for acetylene-air mixtures and the results published by Pickering and Linnett (Ref.24), Gaydon and Wolfhard (Ref.23) arrived at the conclusion that the flame velocity does not depend on pressure. Analysing published results it can be concluded that, whilst for oxygen mixtures the independence of the flame velocity on the pressure can be considered proved, such a conclusion for air mixtures contradicts

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

Influence of the pressure on the normal velocity of flame propagation.

of the apex of the flame cone from direct photographs of the flame. Usually the flame was photographed on a low sensitivity film with long exposure [illegible] and the obtained negative was projected onto a screen. The test rig included a cylindrical [illegible], a fuel preheater, a burner and other [illegible] for preparing the combustion mixture. [illegible]. The used investigating gaseous as well as liquid fuel. [illegible] gaseous fuel contained 75% methane [illegible] % CO, [illegible] liquid fuel was aviation gasoline [illegible] of 10 [illegible]. 150°C producing thereby a pressure of [illegible]. The experiments with methane-air mixtures [illegible] air mixtures were effected for the pressure range of 760 to 100 mm Hg with a constant [illegible] of 1700. The used source of ignition enabled [illegible] the limit pressures and the limit flame velocities. The results of the flame velocities as a function of the pressure for various concentrations of the fuel [illegible] gaseous mixtures are graphed in Fig. [illegible] gasoline-air mixtures in Fig. [illegible]. The dependence of the flame velocity U in cm/sec on the pressure P, mm Hg at

Card 4/7

Influence of [illegible] propagation.

various concentrations is [illegible] Fi[illegible] methane-air and in Fi .4 for [illegible] Khitrin, L. N. (Ref.1[illegible]) [illegible] of the flame [illegible] is an important [illegible] combustion process. Since in [illegible] experiments the changes in the [illegible] are very slight, it can be assumed [illegible] mixture is constant. The mass flame velocities as a function of pressure for all the [illegible] referred to in the graph, Fig.7, are [illegible] in Fig.[illegible] and it can be seen that the picture is [illegible] for methane-air and for gasoline-air [illegible], the mass flame velocity decreases [illegible]. According to Khitrin the dependence [illegible] flame velocity on the pressure can be [illegible] following equation:

$$m' = m_o + A(P - P_o)^n \qquad (5)$$

where m_o is the limit mass velocity of [illegible] flame, P_o is the minimum pressure, A - a coefficient [illegible] power index.

Card 5/7

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

Influence of the pressure on the normal velocity of flame propagation.

large number of mixtures of hydrocarbons [illegible] are not excessively poor or excessively rich, the flame velocity changes with the pressure in accordance with the following relation:

$$U \approx P^{-\gamma} \quad (\gamma\ 0.25 \text{ to } 0.5) \qquad (4)$$

This indicates that for air mixtures the effective order of reactions according to pressure, $\nu \approx 1.5$ to 1.4, whilst, as can be seen from the data of other authors (summarised in a table), in oxygen mixtures the flame velocity does not depend on the pressure and in this case $\nu = 2$.

Acknowledgments are made to A. S. Predvoditelev and L. N. Khitrin for their advice and assistance.

Card 7/7 There are 15 figures, 1 table and [illegible] references, 9 Russian, 23 English.

SUBMITTED: October 11, 1956.

ASSOCIATION: Power [illegible] Institute, Ac.Sc. USSR. (Energeticheskiy Institut AN SSSR).

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

[illegible]

[illegible] 3) theoretical inves- [illegible] combustion and [illegible] and Hadamard for describing [illegible] have been established [illegible] a special case [illegible] (compatibility) [illegible] generalization for [illegible] quantities [illegible] References [illegible]

[illegible]

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

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10(2,7)

66384
SOV/170-59-2-2/23

AUTHORS: Gol'denberg, S.A., Iyevlev, V.N.

TITLE: The Determination of the Intensity of Turbulence Along a Heat Source

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 2, pp 10-16 (USSR)

ABSTRACT: The paper describes an attempt to establish the applicability of the statistical theory of isotropic turbulence for the determination of the intensity of turbulence of an air flow, streaming from a cylindrical tube, in the region of its core. The authors analyze the basic equation for the determination of turbulence parameters in an isotropic turbulent field, Formula 1, obtained first by Taylor /Ref 1/ and consider two extreme solutions: 1. For the case of a short time interval and 2. For the case of a long interval of time. In the first case the coefficient of turbulent diffusion grows linearly with time, Formula 9; in the second case, i.e., at a considerable distance from the source, the value of this coefficient tends to a constant magnitude, Formula 11. The authors then consider theoretically the case of a point source of heat and report on the experiments carried out by them with a gas-oxygen burner, taken as a "point" source, placed co-axially in a cylindrical tube of 32 - 34 mm in diameter. Figure 1 show typical curves of temperature distribution along a transverse

Card 1/3

The Determination of the Intensity of Turbulence Along a Heat Source

direction relative to the air flow at various distances along the flow. The temperature was measured by a thermocouple with corrections for radiation. The analysis of the results shows that the distribution of temperatures in the central part of the air flow corresponds rather well to the Gauss law (Figure 2). The calculated values of turbulence intensity on the tube axis agree well with the data obtained with an ETAM-3A electro-thermoanemometer by S. I. Tkachuk, a scientific worker of the laboratory of combustion processes of the ENIN, and V. M. Panteleyev, a radiotechnician. The experiments carried out by the authors have established that relatively homogeneous fields of turbulent pulsations are observed in the central part of the flow streaming out of a tube in the region of ≈ 0.25 D as it is shown in Figure 4. The intensity of turbulence varies insignificantly at a

Card 2/3

66384

SOV/170-59-2-2/23

The Determination of the Intensity of Turbulence Along a Heat Source

distance of 2D from the end of the tube and practically does not depend on the flow velocity.

There are: 4 graphs and 5 references, 3 of which are Soviet and 2 English.

ASSOCIATION: Energeticheskiy institut AN SSSR (Power Engineering Institute of the AS USSR), Moscow.

Card 3/3

SOV/24-59-2-4/30

AUTHORS: Gol'denberg, S. A., Pelevin, V. S. (Moscow)

TITLE: Influence of Pressure on the Propagation of Flames in Turbulent Flow (Vliyaniye davleniya na skorost' rasprostraneniya plameni v turbulentnom potoke)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1959, Nr 2, pp 26-31 (USSR)

ABSTRACT: The process of flame propagation in well-mixed benzine-air mixtures at pressures below atmospheric has been investigated, using previously described experimental methods (Ref 1). The propagation velocity was measured photographically; the air pressure varied from 760 to 100 mm and the Reynolds number from 4000 to 20 000 Curves are given (Fig 1) showing the variation of flame velocity (u_T) with fuel concentration (C) at various pressures (p) and Reynolds numbers (R) . Graphs of log u_T against log p indicate

Card 1/2

SOV/24-59-2-4/30

Influence of Pressure on the Propagation of Flames in Turbulent Flow

that u_T varies as $p^{-0.25}$. Similar analysis of the data in terms of Reynolds number suggests that u_T varies approximately as $R^{0.715}$. There are 4 figures and 12 references, of which 5 are Soviet, 6 English and 1 German.

ASSOCIATION: Energeticheskiy institut AN SSSR (Power Institute Academy of Sciences USSR)

SUBMITTED: November 16, 1956.

Card 2/2

PHASE I BOOK EXPLOITATION 30..

Akademiya nauk SSSR. Energeticheskiy institut

Goreniye pri ponizhennykh davleniyakh i nekotoryye voprosy stabilizatsii plameni v odnofaznykh i dvukhfaznykh sistemakh (Combustion at Reduced Pressures and Certain Problems in the Stabilization of the Flame in Single-Phase and Two-Phase Systems) Moscow, 1960. 85 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Energeticheskiy institut imeni G. M. Krzhizhanovskogo.

Resp. Ed.: L. N. Khitrin; Ed. of Publishing House: Ye. N. Grigor'yev; Tech. Ed.: V. N. Karpov.

PURPOSE: This book is intended for scientists engaged in combustion research.

COVERAGE: The book contains five reports delivered at the Obshchemoskovskiy seminar po goreniyu (Moscow General Seminar on Combustion) in 1958. The problems discussed in these reports concern the effect of reduced pressure on the ignition and combustion of a stream of gas-vapor mixture in turbulent flow. Each report is followed by Soviet and other references

Card 1/6

The increase in the total length of a [illegible] flame torch is aggravated by the turbulence loss behind grids or stabilizing devices. 3) Thermoanemometric measurements show that the dependence of turbulence intensity ε on pressure p corresponds to [illegible] $p^{2.2}$.

Gol'denberg, S. A. Effect of Reduced Pressure on Flame Propagation and Combustion Zone in a Turbulent Stream 24

This study deals with experimental [illegible] of flame propagation in laminar and turbulent streams at reduced pressure and shows that the density of the medium, which affects [illegible] of turbulent and normal flame velocities, is the determining [illegible]. The author gives experimental data on combustion-zone length in [illegible] stream during the burning of premixed fuel-air mixtures [illegible] pressure and constant coefficient of excess air, as well as [illegible] atmospheric pressure and variable coefficients of excess air. These data are analyzed from the standpoint of possible theoretical [illegible] for combustion-zone length in a turbulent torch when the stream is [illegible] from the periphery.

Card 5/6

24109
S/196/61/000/006/004/014
E073/E535

11.7200

AUTHOR: Gol'denberg, S.A.

TITLE: Influence of reduced pressure on the flame propagation in the combustion zone in a turbulent flow

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, 1961, No.6, p. 7, abstract 6G49. (Sb. Goreniye pri ponizhennykh davleniyakh i nekotoryye vopr. stabilizatsii plameni v odnofazn. i dvukhfazn. sistemakh, M., AN SSSR, 1960, 24-42)

TEXT: The influence of pressure on the speed of flame propagation and the dimensions of the combustion zone behind the flame front was investigated in a cylindrical burner, d = 16 mm, without a turbulizing lattice. In the experiments a gasoline-air mixture was used both under laminar and turbulent conditions. The pressures varied between 100 and 760 mm Hg. The ignition was stabilized by means of a flame ring at the edge of the burner. The speed of the flame was determined by direct photography of the internal light emitting cone. In determining the pressure dependence of the turbulent flame speed, the Re numbers were varied

Influence of reduced pressure S/196/61/000/006/004/014
E073/E535

between 4×10^3 and 20×10^3. The intensity of the turbulence at the outflow from the nozzle was $\varepsilon = 4-5\%$. In presence of a flame a considerable elongation of the core of the stream of the hot mixture was observed as compared to conditions in absence of a flame. The conclusion was arrived at that for a constant mass speed of the flow of the burning mixture (Re-const), the dependence of the speed of the flame propagation (U_T) on the pressure (p) in laminar and in turbulent flows can be represented in the form of u_T and $p^{-0.25}$. The authors investigated the influence of pressure on the dimensions of the combustion zone, the length of which was determined on the basis of the CO_2 content in the combustion products at the axis of the flame and from the temperature, which was measured by the method of reversing the spectral lines of Na. The experiments were made for an excess air coefficient $\alpha = 1.15$. The maximum degree of combustion achieved thereby was 80 to 85%. A dependence of the length of the combustion zone on the pressure was established. With decreasing pressure (due to changes in the turbulence characteristics) the length of the combustion zone will increase for a given constant scale of turbulence, $l \sim d$. In the

Card 2/3

last stage of combustion when $\varphi \geqslant 80\%$, the process of combustion in the turbulent flow can be satisfactorily expressed by purely kinematic equations. The gradient of flame concentration along the cross-section of the combustion chamber decreases to such an extent that the combustion mixture which is diluted by the combustion products becomes quasi-homogeneous. 11 references.
Abstracted by V. Babiy.

[Abstractor's Note: Complete translation.]

25745
S/123/61/000/012/038/042
A004/A101

11.7100

AUTHOR: Gol'denberg, S. A.

TITLE: Ignition in the flow

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 12, 1961, 22-23, abstract 12T182 (V sb. "3-ye Vses. soveshchaniye po teorii goreniya. v. 12". Moscow, 1960, 228-237)

TEXT: The author presents a survey on the theory of ignition and its field of application from the viewpoint of the theory of boundary layers. He investigates the problem of ignition in the flow by incandescent bodies. For this purpose, differential equations of momentum, continuity, energy and diffusion are utilized. Assuming that in the initial stage of the process the boundary layer and temperature boundary layer change very little up to the moment of ignition of the mixture in comparison with the case of an unreactive medium, while the basic reaction is taking place in a narrow zone, the problem can be reduced to the solution of the mentioned equations but without a source. It is shown that, as in the case of ignition during the motion of the ideal liquid, in the case of a viscous liquid flowing around a plate the ratio of the distance at which the

Card 1/3

mixture is ignited to the velocity of flow motion is a constant magnitude (the temperature of the body being constant). The principal conclusions are obtained which are correct for bodies of different configuration, if the heat exchange law for them is known. The problem of ignition by a flame source is analyzed. In the practical aspect the problem of stabilizing the flame by bodies of poorly streamlined shape is here of greatest interest. The theoretical analysis of such processes is rather complicated and represents hitherto an unsolved problem. The author presents semi-empirical results on the interrelation of the Re and Nu criteria depending on the nature of the boundary layer and the relation expressing the effect of pressure and temperature on the characteristical time. The problem of stabilizing the flame by a jet is investigated, taking as an example the interaction of a flat jet directed along the normal of the flow. The author presents the dependence of the length of the circulation zone on the dimensions of the slots from which the jet flows out and the ratio of jet velocity to that of the main flow. A connection has been established between the characteristical geometric dimensions during the stabilization by the jet and the bodies of poorly streamlined shape at the given constant mixture concentration. The author has calculated the values of equivalent diameters of the flame stabilizers, depending on the velocity ratio of the main flow and the stabilizing jet. A comparison

25745
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A004/A101

Ignition in the flow

with experimental data is carried out. It is considered that the analysis of ignition in the flow on the basis of the boundary layer theory makes it possible to describe from a single viewpoint the ignition process by incandescent bodies, the flame stabilization by bodies of poorly streamlined shape and the flame stabilization by a jet. There are 2 figures and 22 references.

Sh. M. S.

[Abstracter's note: Complete translation]

Card 3/3

S/024/60/000/02/026/031
E073/E135

AUTHOR: Gol'denberg, S.A. (Moscow)

TITLE: Ignition in a Flow over a Hot Body

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 2, pp 195-197 (USSR)

ABSTRACT: The problem of ignition over a hot body in a flow was considered by L.N. Khitrin (7th Symposium on Combustion, London 1958) on the basis of classical methods of solution of the cooling of bodies in an ideal fluid. In this brief communication the problem of ignition by hot bodies in a flow is solved by the methods of the boundary layer theory, particularly a laminar boundary layer. An accurate solution of the problem could be obtained by solving simultaneously the non-linear differential equations of a two-dimensional flow, Eqs (1) - (4), p 195. A number of simplifications are made, and it is concluded that in spite of these simplifications it is possible to obtain solutions which permit determining the main parameters on which the process of ignition in a flow by a hot body depend, and the physical picture of such an ignition. In some cases the problem of ignition in a

Card 1/2

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E073/E135

Ignition in a Flow over a Hot Body

flow can be solved accurately, and in this respect the work by P. Chambré (Ref 10) on the solution of the problem of ignition of a moving combustible gas stream surrounding a hot body is of considerable interest.
Acknowledgement is made to L.N. Khitrin for his comments.
There are 10 references, of which 7 are Soviet and 3 English.

Card 2/2

ASSOCIATION: Energeticheskiy institut Akademii nauk SSSR (Power Institute, Academy of Sciences, USSR)

SUBMITTED: December 8, 1959

S/170/60/003/03/04/034
B014/B007

AUTHOR: Gol'denberg, S. A.

TITLE: Ignition in a Flow

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 3, pp. 28-35

TEXT: In his introduction, the author refers to a similar paper by L. N. Khitrin (Ref. 3). In the present paper the problem of the ignition of a flow by incandescent bodies is solved on the basis of the laminar boundary layer. The author proceeds from the nonlinear differential equations (1) and (4) for a two-dimensional flow, and extends the results already previously obtained (Refs. 1 and 2). The critical condition mentioned there for the ignition is given and it follows from the present considerations that with an increase of the velocity component U_0, the flame is shifted along the incandescent body, the critical ignition-condition remaining satisfied. Furthermore, ignition by flame sources is dealt with, and it is stated that this process is more complicated. The most interesting problem is the stabilization of the flame, and this problem

Card 1/3

is discussed on the basis of several results obtained (Refs. 8-12, 18-22).
From the Navier-Stokes equations for a two-dimensional flow, the system of equations (13) - (14) is obtained for the case investigated here. By a special definition of quantities, the solution of this system does not depend on Re. Further, the conclusion is drawn that the greatest change in temperature occurs in the thickness of the boundary layer. The experimental data confirm this scheme of flame stabilization. Evaluation of the experimental data showed that formula (11) for the laminar boundary layer describes the process up to Re = $5 \cdot 10^5$ satisfactorily. This is connected with the fact that the development of the turbulent boundary layer in burning occurs at high Re numbers. In the last part the lack of a method of calculating the stabilization of the flame is pointed out. The author investigates the interaction between a flow and a plane jet which is perpendicular to this flow. Formulas (25), (27), and (28) are obtained, from which the limits of flame stabilization may be calculated. Fig. 1 graphically shows experimental and calculated curves of the limits of flame stabilization. Fig. 2 shows the calculated values of the equivalent diameters of flame stabilizers as dependent on the velocity components. The author finally thanks Corresponding Member of the AS USSR L. N.

VC

Ignition in a Flow

S/170/60/003/03/04/034
B014/B007

Knitrin for discussions and advice. There are 2 figures and 21 references: 13 Soviet, 6 English, and 2 French.

ASSOCIATION: Energeticheskiy institut im. G. M. Krzhizhanovskogo AN SSSR, g. Moskva (Institute of Power Engineering imeni G. M. Krzhizhanovskiy of the AS USSR, City of Moscow)

Card 3/3

GOLDENBERG, S. A.

BAZHENOVA, T. V. - "Evaluation of time of relaxation of carbon dioxide dissociation according to shock tube experiments", and "Determination of the dissociated CO_2 flow condition after the normal shock on the rarefaction wave arising while flowing around a protuberant angle"

GOL'DENBERG, S. A. - "Ignition in the flow"

KHITRIN, Lev Nikolayevich - "Diffusion effect on ignition characteristics of gas mixtures ignited by a heated surface"

[illegible], V. G. and KOZLOV, G. I. - "One-impulse shock tube investigation of the kinetic thermal decomposition of methane"

KOZLOV, G. I. - "Calculation of normal rate of flame propagation of methane and some other hydrocarbons"

LOBASTOV, U. S., and BAZHENOVA, T. V. - "Research on absorption of radio waves by air following the shock wave"

[illegible], I. M. - "The problem of ignition in supersonic gas flow decelerated at an obstacle"

SALAMANDRA, G. D., and SEVASTYANOVA, I. K. - "Amplification of the shock waves during transition through the flame front", and "Formation of weak shock waves before the flame front and their role in organizing the process of explosive mixture burning in tubes."

Reports to be submitted for the 9th Intl. Symposium on Combustion, Ithaca, New York 27 Aug - 1 Sep 1962.

All affiliated with Inst. of Energetics im. G. M. Krzhizhanovskiy, Moscow.

SOBOLEV, G.K., kand.tekhn.nauk [translator]; GOL'DENBERG, S.A., kand.tekhn.nauk, red.; SHEMANINA, V.N., red.; DOTSENKO, V., tekhn.red.

[Flames and chemical kinetics] Plamena i khimicheskaia kinetika; sbornik statei. Moskva, Izd-vo inostr.lit-ry, 1961. 352 p. Translated from the English. (MIRA 15:2)
(Flame) (Chemical reaction, Rate of)

38601
S/170/62/005/007/002/010
B178/B104

11.7200

AUTHORS: Igovlev, B. N., Gol'denberg, S. A.

TITLE: The influence of diffusion factors on the stabilization of a flame

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 5, no. 7, 1962, 18-22

TEXT: The causes of experimental values for the critical rates of flame-breaking on small stabilizers deviating from the relation

$$\frac{wd}{\nu} = K\left(\frac{u_n d^2}{a}\right). \qquad (1)$$

were studied. For this purpose experiments were made with a gasoline-air mixture, and with conical and cylindrical stabilizers. It is shown that excess air has the effect of steepening the upper part of the curve of flame-breaking capacity plotted against the residual air coefficient. Other fuels (e.g., methane-air mixture) do not behave in this way. The shift of the curve depends on the coefficients of diffusion and thermal diffusivity of the fuel. The air excess in the circulation zone behind a

Card 1/2

cylindrical stabilizer is entirely different from that in the initial mixture, wherein the nitrogen content increases while the temperature drops. This difference is not observable behind a conical stabilizer. The deviations from Eq. (1) are explained as being due to: (1) the change in composition of the mixture; (2) the change in temperature of the combustion products; (3) the change in the velocity of flame propagation. These phenomena are caused by molecular diffusion under conditions where the diffusion coefficient of a fuel differs greatly from its coefficient of thermal diffusivity. There are 2 figures and 2 tables.

ASSOCIATION: Energeticheskiy institut imeni G. M. Krzhizhanovskogo, g. Moskva (Power Engineering Institute imeni G. M. Krzhizhanovskiy, Moscow)

SUBMITTED: October 25, 1961

IYEVLEV, V.N., kand.tekhn.nauk; GOL'DENBERG, S.A., kand.tekhn.nauk

Ignition from a flame source in the flow of homogeneous fuel-air mixtures. Teploenergetika 8 no.5:22-26 My '61. (MIRA 15:4)

1. Energeticheskiy institut im. Krzhizhanovskogo.
(Combustion)

IYEVLEV, V.N.; GOL'DENBERG, S.A.

Effect of diffusion factors on flame stabilization. Inzh.-fiz. zhur. 5 no.7:18-22 Jl '62. (MIRA 15:7)

1. Energeticheskiy institut imeni G.M.Krzhizhanovskogo, Moskva.
(Flame) (Diffusion)

GOL'DENBERG, Shika Aronovich; ANGPOL'SKIY, M.G., red.; GUSHCHINA, R.N., red.izd-va; KARLOVA, G.P., tekhn. red.

[RK brand saw frame] Lesopil'naia rama marki RK. Moskva, Goslesbumizdat, 1963. 30 p. (MIRA 16:5)
(Sawmils)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

L 13668-63 EPF(c)/EWT(m)/BDS AFFTC/APGC/RPL Pr-4 EW/WW/JW/MH

ACCESSION NR: AP3004805 S/0179/63/000/004/0112/0115

AUTHOR: Gol'denberg, S. A. (Moscow); Iyevlev, V. N. (Moscow)

TITLE: The effect of turbulence in the flow of combustible mixtures on the ignition process

SOURCE: AN SSSR. Izv. Otd. tekh. nauk. Mekhanika i mashinostroyeniye, no. 4, 1963, 112-115

TOPIC TAGS: turbulence effect, ignition temperature, flammability limit, burner, turbulence profile, ignition property

ABSTRACT: The effect of turbulence in the flow of premixed gasoline-air mixtures on the ignition temperature and the limits of flame stability was studied in a tubular burner (diameter, 30 mm; length, 300 mm) which was equipped with a concentrically located water-cooled additional burner (inner diameter, 3.6 mm; outer diameter, 7 mm) serving as the ignition source. The cooling-surface area of the source could be varied to give source temperatures, with methane-oxygen mixtures, ranging from 1300 to 2200C. The source temperature was measured spectroscopically 1—2 mm downstream from the source by the method of sodium-line reversal. Turbulence varying from 5.5 to 10.5% was generated in the vicinity of

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

L 13668-63

ACCESSION NR: AP3004805

the source by turbulence grids located inside the burner, 38--105 mm from the outlet. Turbulence was measured 1 mm downstream from the burner outlet by an electric ETAM-3A thermoanemometer. Radial turbulence profiles in the absence of combustion were measured with and without the source and turbulence grid. The main results of the study are presented in the Enclosure. Fig. 1 shows that with increasing turbulence the ignition properties deteriorate and the ignition temperature increases substantially. Fig. 2 shows that the flammability limits as a function of the air excess factor with 8% turbulence (grid located 65 mm from the outlet). Analysis yielded the following formula for correlating flow velocity with turbulence at Nu = const:

$$w = w_0 - K(\varepsilon - \varepsilon_0),$$

where w is flow velocity at turbulence ε, w_0 is initial flow velocity at initial turbulence ε_0, and K = 4. Applied to an example, the formula yielded a flow velocity at a turbulence of 8% of 16 m/sec, compared with 19 m/sec determined by experiment. This corresponds to 31 m/sec at a turbulence of 5% and identical Nusselt numbers and ignition temperatures (1500C). "The authors express their sincere thanks to L. N. Khitrin for his suggestions." Orig. art. has: 7 figures and 4 formulas.

Card 2/4 2

ACCESSION NR: AP4024450 S/0281/64/000/001/0116/0122

AUTHOR: Gol'denberg, S. A. (Moscow); Solov'yeva, L. S. (Moscow)

TITLE: A study on the characteristics of ignition of a combustible gas stream by countercurrent jets

SOURCE: AN SSSR. Izv. Energetika i transport, no. 1, 1964, 116-122

TOPIC TAGS: combustion, combustion stability, flame stabilization, jet, countercurrent jet, ignition, combustion chamber

ABSTRACT: The stabilization of premixed gasoline-air flames by means of countercurrent injection of air was studied in a 30-mm-diameter quartz tube equipped with a water-cooled injector (nozzle diameter, 0.6 or 0.9 mm). Air in amounts not exceeding 1—1.5% of the basic gasoline-air mixture was injected countercurrently to the gasoline-air flame at injector pressures of 1.3—4.5 atm gage. The equivalence ratio was varied until blowoff occurred, and a plot of the equivalence ratio at blowoff versus gasoline-air stream velocity was obtained (Figs. 1 and 2 of Enclosure). The blowoff velocity of the gasoline-air flame increased with increasing injector pressure. At all injector

ACCESSION NR: AP4024450

pressures maximum blowoff velocities were obtained at an equivalence ratio of 0.6. The stabilizing effect of the countercurrent air jet is attributed to a flow recirculation zone which causes continuous ingnition of the fresh gas mixture by the combustion products. The penetration distance of the jet was determined by flame photography as a function of the weight flow ratios of the main and stabilizing jets. Measurements showed that the dimensions of the countercurrent jet are not affected by the flame temperature but are controlled by the flow dynamics of the cold isothermal streams only. An empirical formula was derived correlating the ratio of jet penetration length to nozzle diameter with the injector pressure. In connection with the development of combustion processes for high-efficiency combustion chambers with controllable performance parameters, experiments were also made with the same equipment with methane-air mixtures used for stabilization. In these experiments the blowoff velocity of the main stream was determined as a function of the equivalence ratios of the gasoline-air stream and the stabilizing methane-air jet. A maximum blowoff velocity of about 40 m/sec was obtained at an equivalence ratio of 1.3 (stabilizing jet) and 0.8 (main gasoline-air jet). (See Fig. 3.)

ACCESSION NR: AP4024190 S/0294/64/002/001/0058/0064

AUTHOR: Gol'denberg, S. A.; Iyevlev, V. N.; Leont'yeva, Z. S.

TITLE: Determination of electrical conductivity of high-temperature combustion products by the induction method

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 1, 1964, 58-64

TOPIC TAGS: electrical conductivity, high temperature gas, combustion product, combustion, rocket exhaust, induction method

ABSTRACT: The electrical conductivities of combustion products of gasoline-oxygen mixtures in the temperature range of 2600—3000K at atmospheric pressure were measured by the induction method. Fig. 1 of Enclosure shows the experimental assembly used for obtaining the high-temperature gases. A homogeneous gasoline-air mixture passes into the burner, which consists of several sections. In section 1, the combustible mixture is mixed with oxygen injected through small orifices and is then ignited by a continuous-action gas-oxygen ignition source. Above the ignition source, water-cooled combustion chamber 3 is installed, in which intensive mixing and combustion take place.

ACCESSION NR: AP4024190

Combustion is completed in quartz tube 6, (diameter, 40 mm; length, about 300 mm). To cool the chamber walls, air is passed through the jacket formed by quartz tubes 6 and 7. Salt solutions are introduced into section 2 through an atomizer nozzle to increase the electrical conductivity of the high-temperature gases. The assembly has the following performance parameters: consumption of the air-oxygen mixture, 54—70 m^3/hr, and gasoline consumption, 17—24 kg/hr. The concentration of oxygen in the mixture is varied from 38 to 60%. The flow velocity of the high-temperature combustion products is varied from 155 to 190 m/sec. The gas temperature, which was calculated on the basis of the gas composition and measured by the method of the sodium D-line reversal, is varied in the range of 2740—3030K. Potassium salt is injected in the form of an aqueous solution of KCNS. Provision is also made for simultaneous injection of dry potassium carbonate. The operation of the IEP-01 instrument used for determining the electrical conductivity is based on the interaction of a conductive medium with the radial component of a primary magnetic field. (See Fig. 2.) Fig. 3 shows the experimental and calculated electrical conductivities of the high-temperature gases. Expressions were also derived for calculating the induced electromotive force. The results indicate that the electrical conductivities of combustion products containing 0.7—1.5%

ACCESSION NR: AP4024190

potassium in the temperature range of 2700—3000K vary in the range of 0.3—0.9 $ohm^{-1}cm^{-1}$. The determined electrical conductivities were in good agreement with values calculated by use of a correction factor. Orig. art. has: 4 figures, 3 formulas, and 1 table.

ASSOCIATION: Energeticheskiy institut im. G. M. Krzhizhanovskogo (Power Engineering Institute)

SUBMITTED: 13Jul63 DATE ACQ: 16Apr64 ENCL: 03

SUB CODE: PR NO REF SOV: 006 OTHER: 009

Card 3/6

ACCESSION NR: AP4042460 S/0294/64/002/003/0344/0350

AUTHOR: Gol'denberg, S. A.

TITLE: Flame stabilization with countercurrent jets

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 3, 1964, 344-350

TOPIC TAGS: jet propulsion, combustion, combustion chamber, flame stabilization, countercurrent jet

ABSTRACT: Flame stabilization by means of countercurrent jets is of practical interest in high-velocity combustion processes as it permits flame stabilization over a wide range of fuel-air ratios, reduction of hydraulic resistance, and control of the operation of the combustion chamber by changing the composition of the jet. Since this type of flame stabilization has not been studied sufficiently as yet and methods for calculating the stabilization characteristics are not available, a theoretical analysis was made of the stabilization process in order to derive relationships correlating the parameters

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ACCESSION NR: AP4042460

SUBMITTED: 13Jul63 ATD PRESS: 3078 ENCL: 01

SUB CODE: PR NO REF SOV: 017 OTHER: 005

Card 3/4

ACCESSION NR: AP4042460

ENCLOSURE: 01

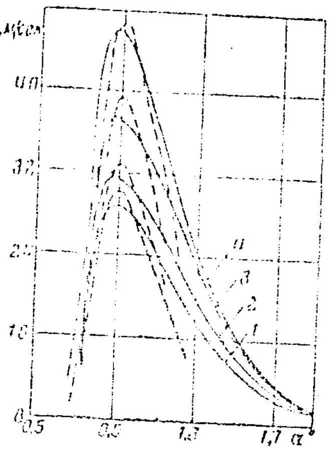

Fig. 1. Dependence of the blow-off velocity on the local air excess factor (α*) at different nozzle pressures and with a nozzle diameter of 0.6 mm

Continuous curves - experimental; dotted curves - calculated; 1 - P = 1.3 atm; 2 - P = 1.8 atm; 3 - P = 3.1 atm; 4 - P = 4.5 atm.

Card 4/4

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9

L 6623-65 EWT(d)/EWT(l)/EWG(k)/EEC(k)-2/EPA(sp)-2/T/EEC-4/EPA(w)-2/EEC(t)/EEC(b)-2/EWA(m)-2 Po-4/Pz-6/Pab-24/Pq-4/Pg-4/Pi-4/Pk-4/Pl-4 IJP(c)/AEDC(b)/RAEM(i)/ASD(p)-3/ASD(a)-5/AEDC(a)/SSD(a)/AFETR/ESD(gs)/ESD(t)/RAEM(t) AT

ACCESSION NR: AP4047371 S/0294/64/002/005/0681/0688

131
129

AUTHORS: Gol'denberg, S. A.; Iyevlev, V. N.; Leont'yeva, S. S.

TITLE: Electric conductivity measurements in high-temperature gas stream

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 5, 1964, 681-688

TOPIC TAGS: electric conductivity, plasma arc, collision cross section, resonator Q factor, plasma conductivity, combustion product

ABSTRACT: The electric conductivity of combustion products was determined in a 2400-3000K stream by varying the Q-factor of a high-frequency coil. In general, the Q-factor of a coil, upon introducing a conductor, is given by

$$\frac{Q_0}{Q_n}=\frac{\omega L_k}{r_k}\,\frac{r_k+r_n}{\omega L_k}=1+\frac{r_n}{r_k},$$

where r_k - coil resistance, ω-coil resonance frequency, L_k - coil inductance, r_π - plasma impedance. The method consists of determining r_π and, thereby, the plasma conductivity. This is done by calculating the circular currents induced by changes in the magnetic current and then determining the resulting emf. The corresponding equation for the figure of merit value in a plasma is derived $\frac{Q_0}{Q_n}-1=\sum_{i=1}^{\infty}\sigma_i\frac{\partial\varphi}{\partial R}\Delta R$,

Card 1/3

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where σ_1 - local conductivity, R - radius of coil, and Φ is a function of the current loop area and radius in the plasma. Optimum coil parameters were found to be L = 2.6 μ henry, S_k = 460 pf, f = 4.6 megacycle and Q_o = 320. Measurements were made in the combustion products of benzene and oxygen with the addition of potassium as seed material. Temperature profiles were determined by sodium D-line reversals. These compared favorably with estimates from a power law relationship used in equilibrium plasmas

$$\frac{\Delta T}{\Delta T_m} = 1 - \left(\frac{r_1}{R_r}\right)^{1/2}.$$

The above leads to a universal temperature distribution curve $T/T_m \approx 0.88$ from which the form-parameter $\bar{\Phi}$ is calculated and subsequently the electric conductivity σ. When these values are compared with the ones calculated by using the Chapman-Cowling expression for conductivity

$$\sigma = 0{,}532 \frac{e^2 n_e}{(m_e kT)^{1/2} \sum_k n_k Q_k},$$

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L 6623-65
ACCESSION NR: AP4047371

where Q for electron-neutral collisions is estimated at 2.5 to 3 x 10^{-15} cm^2, a good agreement is obtained. "The authors express their gratitude to corresponding member of the AN SSSR, L. N. Khitrin, for his advice and valuable remarks." Orig. art. has: 15 formulas and 6 figures.

ASSOCIATION: Energeticheskiy institut im. G. M. Krzhizhanovskogo (Institute of Power Engineering)

SUBMITTED: 13Jul63 ENCL: 00

SUB CODE: ME, EM NO REF SOV: 010 OTHER: 005

Card 3/3

GOL'DENBERG, G.A., inzh.; POLUEKTOV, V.Yu., inzh.

Elevated cable ducts in a chemical plant. Prom. energ. 19 no. 4:35-37 Ap '64. (MIRA 17:5)

ALAD'YEV, I.T.; ALEKSANDROV, B.K.; BAUM, V.A.; GOLOVINA, Ye.S.; GOL'DENBERG, S.A.; ZHIMERIN, D.G.; ZAKHARIN, [illegible]; [illegible]; KNORRE, V.G.; KOZLOV, G.I.; LEONT'YEVA, [illegible]; [illegible], I.M.; MEYEROVICH, E.A.; MIKHNEVICH, G.V.; [illegible]; [illegible]; PREDVODITELEV, A.S.; PYATNITSKIY, I.N.; STYRIKOVICH, [illegible]; TOLSTOV, Yu.G.; TSUKHANOVA, O.A.; CHUKHANOV, Z.F.; SHEYNDLIN, A.Ye.

Lev Nikolaevich Khitrin, 1907-1965; obituary. Izv. AN SSSR. Energ. i transp. no.2:159-160 Mr-Ap '65. [illegible]

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

L 24077-66 EWT(l)/EWP(m)/EWT(m)/EWA(d)/T/EWA(h)/EWA(l) JXT/WW/JW/JWD/WE/JT

ACC NR: AP6014966 SOURCE CODE: UR/0281/65/000/002/0158/0159

AUTHOR: Alad'yev, I. T.; Aleksandrov, B. K.; Baum, V. A.; Golovina, Ye. S.; Gol'denberg, S. A.; Zhimerin, D. G.; Zakharin, A. G.; Iyevlev, V. M.; Knorre, V. G.; Kozlov, G. I.; Leont'yeva, Z. I.; Markovich, I. M.; Meyerovich, E. A.; Mikhnevich, G.V.; Popkov, V. I.; Popov, V. A.; Predvoditelev, A. S.; Pyatnitskiy, L. N.; Styrikovich, M. A.; Tolstoy, Yu. G.; Tsukhanova, O. A.; Chukhanov, Z. F.; Sheyndlin, A. Ye.

ORG: none

125
120
B

TITLE: Lev Nikolayevich Khitrin

SOURCE: AN SSSR. Izvestiya. Energetika i transport, no. 2, 1965, 158-159

TOPIC TAGS: academic personnel, physics personnel, combustion, carbon, high temperature research, plasma beam, fuel

ABSTRACT: Professor L. N. Khitrin, Corresponding Member, Academy of Sciences USSR, State Price Laureate, and Doctor of Engineering Sciences, died after a short but severe illness at the age of 58. He was well known here and abroad as an outstanding scientist and specialist in the field of combustion theory and the development of methods for speeding up burning of fuel. He began his scientific work at the All-Union Heat Engineering Institute after graduating from the physics department of Moscow University in 1930. His early work was on the propagation of flames in gases, and on heterogenous combustion. In 1948 he defended his Doctor's Dissertation on the theory of combustion of car-

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ACC NR: AP6014966

bon. His monograph "Combustion of Carbon" was awarded the State Prize in 1950. In 1951 he became the permanent director of the laboratory for the intensification of combustion processes of the G. M. Krzhizhanovskiy Power Institute. He was elected a corresponding member of the Academy of Sciences USSR in 1953. He headed the All Union Advisory Board on combustion, represented Soviet science at International Symposia, and was a member of the International Institute of combustion. For a number of years, he directed the Moscow general seminar on combustion, and took an active part in the work of the Scientific Council of the Academy of Sciences USSR, on high temperature heat physics, and of the scientific council on the comprehensive utilization of fuel. He devoted a large amount of attention to teaching work. He directed the Combustion Division of the Physics Department of Moscow State University. His monograph "Physics of Combustion and Explosion" (1957) is a basic text for students in this field. Three Doctor's Dissertations and fifteen Candidate Dissertations were defended under his direction. In the last years of his life he directed work on methods for comprehensive utilization of fuel at power stations so as to obtain valuable products from the mineral part of the fuel, as well as work on the physical chemical processes in a plasma stream, and the mechanism of interaction between carbon and gases. He was the author of more than 60 scientific works, for which he was awarded the Order of the Red Banner of Labor and medals. Orig. art. has: 1 figure. [JPRS]

SUB CODE: 21, 20 / SUBM DATE: none

Card 2/2

GOL'DENBERG, Sh.A.

Equipment for manufacturing wood boxes. Biul.tekh.-ekon.inform. no.9:58-61 '61. (MIRA 14:9)

(Woodworking machinery)

MODIN, Nikolay Alekseyevich; LYUBOSLAVSKIY, Vadim Dmitriyevich; GOL'DENBERG, Sh.A., red.; LEBEDEVA, I.D., red.izd-va; SHIBKOVA, R.Ye., tekhn. red.

[Boring holes and cutting sockets in wood]Sverlenie otverstii i frezerovanie gnezd v drevesine. Moskva, Goslesbumizdat, 1962. 131 p. (MIRA 16:3)

(Woodworking)

GOL'DENBERG, Sh.A.; ZHUKOV, M.A.

The US-2M universal woodworking machine. Biul.tekh.-ekon.inform. no.2:41-43 '62. (MIRA 15:3)

(Woodworking machinery)

GOL'DENBERG, Sh.A.

The KPA-20 machine for manufacturing round sticks. Biul.tekh.-ekon.inform. no.2:46-47 '62. (MIRA 15:3)
(Woodworking machinery)

GOL'DENBERG, Shika Aronovich; [illegible], I. A., red.

[Equipment for the manufacture of wooden containers] Oborudovanie dlia proizvodstva dereviannoi tary. Moskva, Izd-vo "Lesnaia promyshlennost'," 1964. [illegible] p. (MIRA [illegible])

GOL'DENBERG, S. I.

Gol'denberg, S. I. and Golodets, R. G. - "Psychopathological syndromes in the clinic for gun-shot wounds of the brain," Trudy Tsentr. in-ta psikhiatrii, Vol. IV, 1949, p. 37-48

SO: U-4934, 29 Oct 53, (Letopis 'Zhurnal 'nykh Statey, No. 16, 1949).

AUTHOR: Gol'denberg, S.I. (Engineer) & Shur, G.I. (Engineer) SOV/110-58-10-13/24

TITLE: Problems in the design of hydro-alternator damping windings (Voprosy konstruirovaniya dempfernykh obmotok gidrogeneratorov)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, No.10, pp 51-54 (USSR)

ABSTRACT: A hydro-alternator commonly has damper windings; they are difficult to design because they are at the periphery of the poles where the speed is highest and are commonly made of copper. This is not a strong material at the best of times, and is liable to have been softened by brazing operations during assembly. Although the range of size and speed of hydro-alternators is very wide, in practical cases it is only necessary to consider five typical constructions of damper winding, which are discussed in the present article. The authors propose criteria for the selection of the best design in any particular case with the least waste of time. The mechanical load on the damper winding depends, of course, on the generator overspeed, the number of poles and the diameter; these factors were employed in formulating the criteria. The first criterion gives the radial thickness of the damper segment as a function of the mechanical load on the overhung part of the segment. Expressions are then derived for the weight of the overhung part and for the centrifugal forces acting upon it. An expression is also given for the rigidity of the section and finally an expression for the radial thickness of a rectangular section is derived. The segment is commonly mounted on

Card 1/3

edge if the thickness is greater than 1 cm (Figs 2 - 5) otherwise it is laid flat (Fig.1.). Fig.6. may be used to help in selecting the arrangement of the segment, it is constructed for a thickness of 1 cm, points lying to the left of the curve corresponding to a damper segment laid flat and those to the right, on edge. Cases in which the damper segment is supported only by the damper bars are illustrated in Figs 2 - 5. The second criterion characterises the magnitude of the centrifugal force of the segment and of the jumper per unit length of pole arc. It is used in selecting the method of fixing the segment. Usually the section of the damper segment is half the total section of the damper bars on a pole, which approximately proportional to the pole pitch. Therefore, the weight of the damper segment and jumper are proportional to the square of the pole pitch. An expression is given for the centrifugal force on a damper segment and a new parameter is introduced that is proportional to this force. Permissible ranges of this parameter are then stated. When the damper winding may get very hot, for instance because there is a rectifier load, the construction of Fig.5 is preferable to Fig.4. Various special features of damper winding design are then considered. The different constructions of jumper that are used are illustrated in Fig.7. and the method of selection in particular cases is described. The jumpers are secured by ordinary steel bolts with zinc-plated steel washers. The designs

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of damper winding that have been considered are intended for use in hydro-alternators that do not employ a synchronous starting. When a synchronous starting is used the damper winding gets very hot and allowance must be made for expansion effects. There are 7 figures

SUBMITTED: July 16, 1957

1. Generators--Design 2. Generators--Properties 3. Copper wire--Effectiveness 4. Mathematics

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

GOL'DENBERG, S.I., inzh.

Concerning the strength of hydrogenerator rotors. Elek.sta. 34 no.2:50-51 F '63. (MIRA 16:4)

(Turbogenerators)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

GOL'DENBERG, S.I., inzh.

Calculation of the rotor rims of large hydrogenerators.
Vest. elektroprom. 34 no.2:69-73 F '63. (MIRA 16:2)
(Turbogenerators)
(Hydraulic turbines)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

GOL'DENBERG, S.I., inzh.

Aluminum in a.c. machines. Vest. elektroprom. 34 no.7:78 Jl '63. (MIRA 16:8)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

NEYMAN, Z.B., inzh.; GOL'DENBERG, S.I., inzh.

Synchronous machines with aluminum excitation windings.
Elektrotekhnika 35 no.1:26-29 Ja '64. (MIRA 17:2)

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L 11990-65 EWT(l)/EWP(e)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b) IJP(c)/AS(mp)-2/ AFWL/ASD(a)-5/RAEM(c)/ESD(gs)/ESD(t) JD

ACCESSION NR: AP4048439 S/0181/64/006/011/3484/3486

AUTHORS: Gol'denberg, S. U.; Melik-Gaykazyan, I. Ya.

TITLE: On the kinetics of generation of F centers in NaCl whiskers

SOURCE: Fizika tverdogo tela, v. 6, no. 11, 1964, 3484-3486

TOPIC TAGS: fiber crystal, F center, sodium chloride, x ray irradiation, crystal growth

ABSTRACT: A study was made of the kinetics of the F-center generation in NaCl whiskers irradiated with unfiltered x-rays from a tube with a copper anticathode from a type URS-55a x-ray apparatus operating at 45 kV and 12 mA. The whiskers were either grown (from an aqueous solution or from the gaseous phase) or cleaved (from rock-salt). The dislocation density in the latter is known to be high. Of the samples used, the most perfect were the whiskers grown from the gaseous phase, which have been proved to be free of dislocations

Card 1/3

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up to cross sections of 30 x 100 μ. For samples with a high density of dislocations, the F-center growth curves were of the same kind as the growth curves of NaCl single crystals. Dislocation-free samples grown from the gaseous phase had a completely different kinetics of F-center generation, with saturation in the second stage (localization of electrons at radiation-generated vacancies). Similar growth-curves were found for some 20--30 μ thick solution-grown whiskers, which were obviously of the "exceptional" type just mentioned. The presence of a linear region in the growth curves indicated the generation of anion vacancies. This supports the conclusions of several workers that radiation may generate vacancies and Frenkel' defects in a perfect crystal. The saturation of the process of the F-center generation may be due to the saturation of the vacancy generation process itself or due to the establishment of a radiation equilibrium between the F-centers and complex electron centers. Measurements of the absorption spectra showed that the position and the half-width of the F-band for all the investigated

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

L 11990-65
ACCESSION NR: AP4048439

3

NaCl whiskers were the same as for normal single crystals. "The authors thank E. M. Nadgorny*y for supplying some whiskers and P. P. Odintsov for his help in assembling the microspectrophotometric apparatus." Orig. art. has: 2 figures.

ASSOCIATION: Politekhnicheskiy institut im. G. M. Kirova, Tomsk (Polytechnic Institute)

SUBMITTED: 28May64 ENCL: 00

SUB CODE: SS NR REF SOV: 002 OTHER: 012

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GOLUBCHIK, A.A.; SERGUNIN, K.G.; SAFRONOV, V.S.; KOROTYA, M.Ye.; GOL'DENBERG, S.Z.; SAVAT'YEV, M.I.; BANSHCHIKOV, N.P.

Unit for making 160mm multihollow reinforced concrete slabs. suggested by A.A.Golubchik, K.G.Sergunin, V.S. Safronov, M.E.Korotia, S.Z.Gol'denberg, M.I.Savat'iev, N.P.Banshchikov. Rats.i izobr. predl.v stroi. no.13:9-11 '59. (MIRA 13:6)

1. Po materialam Fryazinskogo stroitel'no-montazhnogo upravleniya stroitel'nogo tresta No.27 Mytishchistroy Glavmosoblstroya.
(Concrete slabs)

KLEINERMAN, L., Conf.; GOLDENBERG, V., dr ; BUSU, I., dr.

Treatment of acute and subactue pulmonary hypertension with ganglionic-blocking agents. Med. intern., Bucur. 11 no.5:739-743 '60.

1. Lucrare efectuata in Clinica medicala, Spitalul "Bernat Andrei" Bucuresti, director prof. C.C. Iliescu.
(HYPERTENSION, therapy)
(METHONIUM COMPOUNDS, therapy)

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ILIESCU, C., Prof.; GOLDENBERG, Valentina; CONSTANTINESCU, M.

Quindine in the treatment of atrial fibrillation. Rumanian M. Rev. 4 no.1:32-35 Ja-Mr '60.

(AURICULAR FIBRILLATION ther.)
(QUINIDINE ther.)

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GOLDENBERG, Valentina, dr., A.S.C.A.R.

Current status of the treatment of hypertensive disease. Med. intern., Bucur 13 no.6:917-928 Je '61.

(HYPERTENSION therapy)

GOL'DENBERG, V.G.; KALABINA, A.V.; SHOSTAKOVSKIY, M.F.

Production of vinyl aryl ethers at a pilot plant. Izv. Fiz.-khim. nauch.-issl. inst, Irk. un. 5 no.1:290-295 '61. (MIRA 16:8)

(Ethers) (Phenol) (Coal—Carbonization)

GOL'DENBERG, V.K., inzh. (Sevastopol')

An efficient method of calculating heat loss. Vod. i san. tekh. no.6:37 Je '62. (MIRA 15:7)

(Heating research)

BEDA, Nikolay Ivanovich; GOL'DENBERG, Ye.A., otv.red.; BELINA, R.A., red.izd-va; ANDREYEV, S.P., tekhn.red.

[Ways of reducing metal waste in rolling mills] Puti snizheniia raskhoda metalla v prokatnykh tsekhakh. Khar'kov, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1960. 125 p. (MIRA 13:7)

(Rolling mills--Quality control) (Steel ingots--Defects)

GOL'DENBERG, Yelena Aleksandrovna; LIBERMAN, L.M., otv. red. [deceased]; LIBERMAN, S.S., red. izd-va; ANDREYEV, S.P., tekhn. red.

[Principles of the economics of metallurgical production] Osnovy ekonomiki metallurgicheskogo proizvodstva. Moskva, Metallurgizdat, 1963. 118 p. (MIRA 16:7)
(Iron industry) (Steel industry)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

GOL'DENBERG, Sh.S.

Forty-two weeks pregnancy in a right rudimentary horn of the uterus. Akush. i gin. 33 no.4:111 Jl-Ag '57. (MIRA 10:11)

1. Iz akushersko-ginekologicheskogo otdeleniya (zav. Sh.S.Gol'denberg) Orgeyevskoy gorodskoy bol'nitsy Mordovskoy SSR.
(PREGNANCY, EXTRAUTERINE)

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USSR/ Electronics - Diodes

Card 1/1 Pub. 89 - 18/24

Authors : Puzhay, A., and Gol'denberg, V.

Title : Typical resistance characteristics of germanium point diodes

Periodical : Radio 5, 45 - 46, May 1955

Abstract : Expert data are presented on the direct and counter resistance characteristics of germanium point diodes. Graphs are given showing the relation between the direct and counter resistance of diodes and the voltage fed to these diodes. The role of load resistance and temperature of the surrounding medium in the selection of diode types is explained. Graphs.

Institution : .....

Submitted : .....

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GOL'DENBERG, V.A.

Category : USSR/Electronics - Semiconductor Devices and Photoelements H-8

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4368

Author : Shchigal', F.A., Madoyan, S.G., Petrov, L.A., Gol'denberg, V.A., Lazareva, G.V., Stepanenko, I.P., Shuyskiy, L.I.

Title : Germanium Diodes and Transistors and their Application

Orig Pub : Radiotekhn proiz-vo Sb. I. M., 1956, 3-25

Abstract : Popular article

Card : 1/1

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[illegible]

Study of sources and ways of [illegible] hepatitis ([illegible]'s disease). [illegible] occurrence [illegible] 11 [illegible], in various [illegible] of Odessa [illegible] (MIRA [illegible])

1. Odesskiy [illegible] epidemiologii i mikrobiologii [illegible] Mechnikova [illegible] Odesskoy [illegible] sanitarno-epidemiologicheskoy stantsii.

G L'DENBERG, V.I.; SAMOZVANTSEVA, Z.M.

Mesozoic stratigraphy of the Toko through and some information about its coal potential. Trudy VAGT no.7:47-51 '61. (MIRA 14:7)

(Aldan Basin—Coal geology)

GOL'DENBERG, Ya.M.

Investigating losses of products in barrels. Kons.i ov.prom. 12 no.5:14-16 My '57. (MLRA 10:8)

1. Ukrainskiy nauchno-issledovatel'skiy institut konservnoy promyshlennosti.

(Canning and preserving)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

GOL'DENBERG, Ya.M.

Green and vinaigrette mixed salads as new canned products.
Kons. i ov. prom. 14 no.3:21-23 Mr '59. (MIRA 12:3)

1. Odesskiy sovnarkhoz.
(Vegetables--Preservation)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000515620012-9"

GOL'DENBERG, Ya.M.

Equipment for the canning of green peas. Kons. i ov. prom. 14 no.4:7-9 Ap '59. (MIRA 12:5)

1. Odesskiy sovnarkhoz.
(Canning and preserving--Equipment and supplies)
(Peas--Preservation)

GOLDENBERG, Ya.M.

Sealing machines for glass containers. Kons. i ov. prom. 14 no.11:11-13 N '59. (MIRA 13:2)

1. Odesskiy sovnarkhoz.
(Canning industry--Equipment and supplies)
(Glass containers)

GOL'DENBERG, Ya. M.; SHNAYDER, B. Ya.

Preserved semiprocessed foods for restaurants and lunchrooms. Kons.i ov.prom. 15 no.4:17-19 Ap '60. (MIRA 13:6)

1. Odesskiy sovnarkhoz (for Gol'denberg). 2. Khimiko-tekhnologicheskaya laboratoriya Odesskogo sovnarkhoza (for Shnayder).

(Food--Preservation)

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SHAPIRO, Leonid Viktorovich; SVETS, Vladimir Yevseyevich;
Prinimal uchastiye ZHIVAGO, V.I., inzh.; GOL'DENBERG,
Ye.A., red.

[Industrial organization in cogging mills] Organizatsiia
proizvodstva v obzhimnykh tsekhakh. Moskva, Izd-vo Metal-
lurgiia, 1964. 118 p. (MIRA 17:6)

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BORISHANSKIY, Valentin Vladimirovich, inzh.; GOL'DENBERG, Yefim Ionovich, inzh.; KATS, A.S., dotsent, kand.ekon.nauk, retsenzent; POGODIN, B.A., inzh., red.; LEYKINA, T.L., red.izd-va; EL'KOKANSKAYA, Ye.A., tekhn.red.

[Organization of technical preparation of production in a machinery plant] Organizatsiia tekhnologicheskoi podgotovki proizvodstva na mashinostroitel'nom predpriiatii. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 81 p. (MIRA 13:1)
(Machinery industry) (Factory management)

[illegible], Ye. [illegible]

[illegible]berg, Ye. [illegible] - "[illegible]," [illegible] ([illegible]), [illegible], p. [illegible]-37

[illegible]: [illegible], [illegible], ([illegible])